DOCTORAL THESIS

Family ownership and the value-relevance of accounting information

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FAMILY OWNERSHIP AND THE VALUE-RELEVANCE OF ACCOUNTING INFORMATION

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Keywords

Agency theory, book value, corporate governance, earnings, earnings management, earning quality, faithful representation, family ownership, intangible assets, relevance, reliability, resource-based view, qualitative characteristics, tobin's *q*, value-relevance, valuation.

Abstract

This thesis investigates the relationship between family ownership and the value-relevance of accounting information. While the value-relevance of accounting information has been widely explored, the research in this area has focused on the traditional agency context of widely held firms, and has overlooked the distinct agency context of family ownership. To address this significant gap in the prior research, this thesis extends the value-relevance literature to consider the impact of family ownership, a distinct agency context that is the predominant business structure in the world and represents a substantial portion of listed firms.

The theoretical development of this thesis proposes that the value-relevance of accounting information is moderated by its qualitative characteristics, specifically by its *faithful representation* and *relevance*. These propositions are based on the normative theory derived from the accounting standards and from positive theories developed through research. This thesis proposes that family ownership is indirectly related to the value-relevance of accounting information, through its relationships to the two moderators *faithful representation* and *relevance*, which are operationalized as accounting information quality and unidentifiable intangible assets.

This thesis uses listed firms on the Australian Stock Exchange (ASX) to test the formulated hypotheses. The relationship between family ownership and accounting information quality is tested using established earnings management models. An experimental variable is developed to estimate unidentifiable intangible assets. This

variable and its estimation is based upon prior research in related areas that uses Tobin's q to measure intangibility. To investigate the relationship between family-ownership and the value-relevance of accounting information, a levels based value-relevance model is used to capture the value-relevance of both earnings and book value.

This thesis finds that family ownership is positively related to the qualitative characteristics of accounting information, specifically accounting information quality and unidentifiable intangibles. The increase in information quality is in addition to the positive effects of governance mechanisms such as block holders and independent audit committees. This suggests that family-owned firms provide accounting information of higher quality, and implies that the agency benefits outweigh any potential agency costs that may arise due to family ownership. Family ownership is also positively related to the level of unidentifiable intangible assets within a firm. This supports prior research that has suggested that family ownership is related to the accumulation of unidentifiable intangible assets, such as social and human capital. Furthermore, both accounting information quality and unidentifiable intangible assets are found to be value-relevant. Firms that report accounting information of higher quality are valued more highly on their earnings, and less on their book value. Furthermore, firms that hold a large amount of unidentifiable intangible assets are valued at higher Price/Earnings and Price/Book Value multiples. This suggests that the market recognizes the omission of these unidentifiable intangible assets in financial statements. Overall, based on these findings, family ownership has a positive influence on the value-relevance of accounting information through its positive influence on accounting information quality and unidentifiable intangible assets.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

Abbreviation	Definition
DD	Dechow and Dichev
DM	Decision-Making
IA	Intangible Asset
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
P/B	Price to Book Value
P/E	Price to Earnings
RBV	Resource-Based View
RI	Residual Income
WACC	Weighted Average Cost of Capital

Statement of Original Authorship

This thesis is submitted to Bond University in fulfilment of the requirements of the degree of Doctor of Philosophy. This thesis represents my own original work towards this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

Signature: _____

Date: _____

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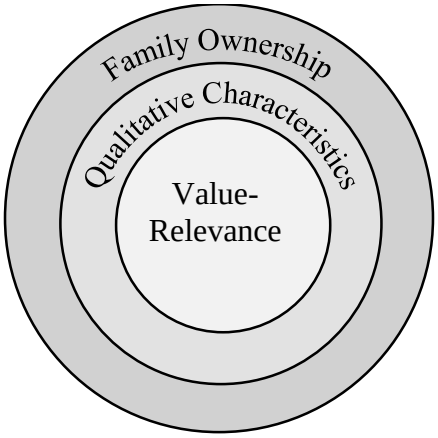
Chapter 1: Introduction

This thesis investigates the relationship between family ownership and the value-relevance of accounting information. Research has largely overlooked the notion that family ownership may be related to the value-relevance of accounting information, despite the fact that family-owned firms are the predominant business structure in the world (La Porta et al., 1999). Existing value-relevance research has focused on the traditional agency context of widely held firms (Ayers, 1998; Barth et al., 1998a; Collins et al., 1997; Dechow et al., 1999; Ohlson & Penman, 1992). However, family ownership is a distinct agency context and its relationship to the value-relevance of accounting information is an unexplored empirical issue. This thesis uses the normative theory found in the International Financial Reporting Standards (IFRS) conceptual framework in exploring and explaining the relationship between family ownership and the value-relevance of accounting information. According to the conceptual framework, the value-relevance of accounting information is dependent upon the qualitative characteristics that it possesses. This thesis proposes that family ownership impacts the qualitative characteristics of accounting information, and that these qualitative characteristics in turn impact the value-relevance of that information. Consequently, the proposed relationship, depicted in *Figure 1-1,* is of an indirect nature.

Figure 1-1 Overview of theoretical links



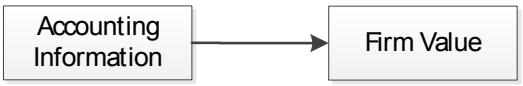
This relationship, and gap in research, is important to address as the International Accounting Standards Board (IASB) states that one of the primary objectives of financial statements is to provide equity investors with decision-useful information. As value-relevance research is the empirical test for the decision-usefulness of information (Barth et al., 2001) an important research question is whether the predominant business structure in the world has an impact on value-relevance and thus usefulness of accounting information.

This chapter provides an introduction to this thesis by firstly exploring the concept of value-relevance and how the qualitative characteristics of information impacts its usefulness for valuation purposes. Then, an overview of family-owned firms and their distinct nature is provided to justify the inquiry into this specific agency context. Next, the primary research question for this thesis is presented; it aims to test the theoretical links between family ownership and the value-relevance of accounting information. Based on this research question and the scope of this thesis, the contribution to research, education, and practice are explored. Finally, the structure of this thesis is provided.

1.1 VALUE-RELEVANCE OF ACCOUNTING INFORMATION

Value-relevance research aims to determine if information is used by investors in the valuation process and is the empirical test for decision-usefulness of accounting information (Barth et al., 2001). In essence, this body of research investigates the statistical association between accounting information and firm value. If accounting information is used in the valuation process then we would expect there to be a high association between the accounting information and firm value, as exemplified in *Figure 1-2*, thus deeming the information as value-relevant (Barth et al., 2001).

Figure 1-2 Value-relevance of accounting information



Early value-relevance research focused on the two primary accounting measures of earnings and book value (Ayers, 1998; Barth et al., 1998a; Collins et al., 1997; Dechow et al., 1999; Ohlson & Penman, 1992). The research has found that while both are value-relevant their individual importance varies based on the state of the firm (Kothari, 2001). Barth et al. (1998a) find that the value-relevance of book value is dependent on the financial health of a firm. As the financial health deteriorates, the explanatory power of book value for market value increases. Conversely, the opposite effect is found for the earnings figure, as the authors find a positive relationship between its explanatory power and financial health (Barth et al., 1998a). The two effects highlight the different roles of the income statement and the balance sheet. Dechow et al. (1999) provide further support for this notion, finding that book value provides additional explanatory power over earnings.

Overall, the importance and value-relevance of accounting earnings and book value has been established over long time periods, with research finding that their

explanatory power for market values has been increasing over the past 40 years (Collins et al., 1997; Francis & Schipper, 1999).

1.2 QUALITATIVE CHARACTERISTICS OF ACCOUNTING INFORMATION

While the value-relevance of earnings and book value are well established, recent research has explored how other information characteristics moderate the value-relevance of earnings and book value, and make them more or less value-relevant (Aboody & Lev, 1998; Marquardt & Wiedman, 2004). This research is consistent with the IFRS conceptual framework, which states that the decision-usefulness of information is dependent upon its qualitative characteristics. Specifically, it states that the two fundamental qualitative characteristics of useful information are *faithful representation* and *relevance*[1]. While empirical research has often not explicitly mentioned these qualitative characteristics, the issues central to the empirical work addresses these two qualitative characteristics.

Early value-relevance research assumed that the accounting information is free of systematic management bias and that the reported information quality was homogenous across firms. However, Marquardt and Wiedman (2004) argue that it is imperative to consider accounting information quality when investigating value-relevance of accounting information. The views of Marquardt and Wiedman (2004) are consistent with agency theory and extensive research into accrual quality, which has shown that managers opportunistically manipulate discretionary accruals (Burgstahler & Dichev,

[1] The term *relevance* is distinct from value-relevance. *Relevance* refers to the qualitative characteristic of information and that it has predictive or confirmatory value (or both). Value-relevance refers to the research that explores statistical associations between information and market value, and is a joint test for the qualitative characteristics of *relevance* and *faithful representation* (Kothari, 2001).

1997; Degeorge et al., 1999). This research, based on agency theory, highlights the importance of considering the quality of the information supplied when investigating value-relevance. If investors do not perceive the supplied accounting information to be trustworthy and unbiased, then it is reasonable to expect that they will find it less useful in their decision-making (Marquardt & Wiedman, 2004). This reasoning is in line with the IFRS conceptual framework, which states that *faithful representation* is one of the fundamental qualitative characteristics of useful information. In other words, if information does not *faithfully represent* the underlying economic phenomena then its usefulness is diminished.

Furthermore, the IFRS conceptual framework states that *relevance* is also a fundamental qualitative characteristic of useful information. Information is considered *relevant* if it is capable of impacting the decisions of users, thus having predictive or confirmatory value (or both) for users. The issue of *relevance* and its potential loss has been highlighted in research that surrounds intangible assets, and specifically the intangible assets that are not included in financial statements and thus classified as unidentifiable (Cañibano et al., 2000). Lev and Zarowin (1999) document a deterioration of the value-relevance of accounting information over the past 20 years. The authors attribute the loss in value-relevance to the shortcomings of the accounting standards to account for intangible assets. The failure to do so has made financial information less accurate in the portrayal of the underlying economic reality of the firm, thus becoming less *relevant* for decision-makers. The concerns of Lev and Zarowin (1999) are shared by others, who suggest that we have moved to a knowledge economy, where tangible assets are becoming less important and that the primary source of value stems from the intangible assets in the economy (Goldfinger, 1997). The inability to account for all intangible assets influences the *relevance* of book value, as the omission

of important assets decreases its predictive and confirmatory value (Barth & Clinch, 1998). This also has implications for the earnings figure, as expenses associated with the creation of these intangible assets are expensed rather than capitalized. According to Stewart (1997), the practice of expensing these costs has caused a loss of *relevance* for the earnings measure as well. Furthermore, several studies have shown that the market positively values capitalization of intangibles in comparison to immediate expensing (Aboody & Lev, 1998; Abrahams & Sidhu, 1998; Lev & Sougiannis, 1996). In other words, research indicates that the level of unidentifiable (omitted) intangible assets within firms may moderate the usefulness of the accounting information they report.

In summary, the existing research has highlighted that while there are several moderators of value-relevant accounting information; two critical moderators emerge, and overlap with the IFRS conceptual framework qualitative characteristics. These are (1) accounting information quality and thus the *faithful representation* of the reported accounting information and (2) the level of unidentifiable intangible assets within firms and their impact on the *relevance* of accounting information. Consequently, this thesis uses these two issues to explore the pathway for the relationship between family ownership and the value-relevance of accounting information.

1.3 FAMILY OWNERSHIP

Family ownership is a distinct agency context compared to widely held firms, as the principal and agent often belong to the same family (McConaughy et al., 2001). As accounting literature is often predicated upon the agency relationship, there has been a growing interest in family ownership and its impact on accounting practices and outcomes (Salvato & Moores, 2010). Researchers have found that family-owned firms have specific agency costs and benefits that impact the performance of the firm

(Anderson & Reeb, 2003), the quality of accounting information (Wang, 2006) and the level of intangible assets (Sirmon & Hitt, 2003). Accordingly, family-owned firms present a unique agency setting to explore value-relevance, as these firms have distinct practices that have direct implications for the two moderators of value-relevant information.

The importance of family-owned firms as a research context stems from the predominance of the business structure and the size of these firms. Family-owned firms are the most predominant business structure in the world (La Porta et al., 1999), roughly 65% to 80% of the world businesses can be deemed as family-owned firms. The prevalence of family-owned firms is higher in emerging economies, nevertheless, even in developed countries like Australia at least 50% of all businesses are family-owned firms (La Porta et al., 1999). Additionally, there is a common misconception that these firms are small and thus insignificant to the economy. Family-owned firms contribute 45% to 70% to a country's GDP (Schwass, 2005), and roughly a third of all publically listed firms in the world are family-owned firms (Anderson & Reeb, 2003; Setia-Atmaja et al., 2011). These factors together establish the prevalence and the significance of family-owned firms in the economy.

The distinctiveness of family-owned firms is the intermingling between the family and the firm. These firms often lack the separation between owners and managers, and have a goal of continuity (James, 1999). Furthermore, the return function for a family owner is not only comprised of a financial return, but also of an emotional return (Astrachan & Jaskiewicz, 2008). The issue of emotional return leads to a series of non-financial goals for family-owned firms (McConaughy, 1999). While traditional economic theory would suggest that pursuing non-financial goals may be detrimental to financial performance, the empirical evidence in regards to family-owned firm

performance indicates that this may not be true (Hasso & Duncan, 2012). The non-financial goal of the continuity of the firm and thus the ability to pass it on to the next generation may lead to the positive effect of negating the short-termism that is detrimental to firms long-term performance (Miller & Le Breton-Miller, 2005; Zahra et al., 2004). The capital that the family has invested in the firm is considered patient capital. In contrast to a non-family investor, the family will not withdraw the capital if a certain financial goal is not met in the short-term (Sirmon & Hitt, 2003). This approach allows them to have a long-term horizon instead of chasing short-run returns at the expense of shareholder wealth. Overall, research has shown that family-owned firms provide an interesting research context as the intermingling between the family and the firm make them distinct from widely held firms. Furthermore, the distinctiveness of family-owned firms has direct implications for the two moderators of value-relevant information.

The primary difference in family-owned firms in relation to accounting information quality and the qualitative characteristic of *faithful representation* is the lack of separation between owners and managers. This distinction is important for this thesis, as the incentives for managing earnings are not the same as in widely held firms. The traditional owner-manager agency conflict, *Type I* agency problem, is mitigated in publically listed family-owned firms (Anderson et al., 2003; Demsetz & Lehn, 1985; Villalonga & Amit, 2006). Nevertheless, the concentration of ownership and management in these firms may lead to *Type II* agency problems, as the family is able to act opportunistically and expropriate wealth from the firm at the expense of minority shareholders. Studies assessing these two opposing effects in family-owned firms often focus on the relationship between family ownership and accounting information quality by using accruals quality as a proxy measure. Prior studies have found conflicting

evidence regarding this relationship, with studies from the US showing a positive relationship between family ownership and accounting information quality (Ali et al., 2007; Wang, 2006), while some non-US studies show a negative relationship (Kim & Yi, 2006; Prencipe et al., 2008; Yang, 2010). A possible explanation for these mixed results is that the studies have used accounting information quality measures that do not properly discriminate between accruals arising from the economic fundamentals of the firm and accruals arising from earnings management. Consequently, the existing evidence regarding the association between family ownership and accounting information quality is not conclusive.

The non-financial goals in family-owned firms also have implications for the level of unidentifiable intangible assets within the firm, and in turn the *relevance* characteristic of the earnings and book value measures. Many authors suggest that intangible assets are now the primary driver of value in firms (Cañibano et al., 2000; Goldfinger, 1997). This development is important to consider in the case of the family-owned firm, as the nature of the family-owned firm leads to an accumulation of intangible assets (Hasso & Duncan, 2012; Miller et al., 2008). The family's connection to the firm impacts decision-making in terms of the horizon, strategy, and governance and results in an accumulation of intangible assets in family-owned firms such as social capital and human capital (Habbershon & Williams, 1999; Sirmon & Hitt, 2003). The work in this area is primarily theoretical, but recently, empirical evidence has confirmed that family-owned firms place greater importance on social and human capital generating activities (Miller et al., 2008). However, information about these unidentifiable intangible asset differences is not captured fully under current accounting standards and, thus, accounting measures of earnings and book value may be deficient in their usefulness for valuation (Lev and Zarowin, 1999). While this deficiency impacts

all firms, it is especially important for family-owned firms as research suggests they may hold more unidentifiable intangible assets (Hasso & Duncan, 2012).

In summary, research has explored the nature and distinctiveness of family-owned firms. The literature has provided indications that family ownership may impact accounting information quality and the level of unidentifiable intangible assets, both of which have a potential impact on the value-relevance of accounting information.

1.4 RESEARCH QUESTION

The overarching research question of this thesis is:

RQ: What is the relationship between family ownership and the value-relevance of accounting information?

The value-relevance of accounting information is moderated by the qualitative characteristics that it possesses. Specifically, empirical work indicates that accounting information quality and the level of intangible assets within the firm moderate the value-relevance of accounting information. Furthermore prior research provides indications that family ownership may impact these two moderators. Thus, this thesis argues that the relationship between family ownership and the value-relevance of accounting information is indirect via the qualities of the accounting information. In Chapter 2, the research question is explored in greater detail and the various related issues and linkages are discussed further.

1.5 CONTRIBUTIONS

The contribution of this thesis can be separated into three distinct categories;. These are: (1) contribution to theory; (2) contribution to practice; (3) and contribution to education.

The theoretical contribution of this thesis is fourfold. First, it provides the conceptual underpinnings for how family ownership impacts the value-relevance of accounting information, and ultimately how family ownership impacts financial value. Second, the empirical work in this thesis adds to the extensive body of knowledge within value-relevance research. While extensive, the question of family ownership structure has been overlooked. Third, this thesis provides an empirical test for the conceptual framework by considering how the qualitative characteristics of *relevance* and *faithful representation* can be operationalized simultaneously in a joint model. Fourth, the empirical work of this thesis adds to the body of knowledge of family-owned firm research. Using accounting research methodologies, this thesis examines whether family ownership in large firms is value adding from the perspective of shareholders, and does so in an Australian context. While family-owned firm research is a growing area, Australian studies in this area are still rare. This is surprising as Australia is a developed economy where there is high investor protection, making it an interesting context to study family ownership in listed firms. Furthermore, this thesis provides researchers with a multitude of avenues for future research. Specifically, it allows future empirical tests of the relationships proposed as well as a basis for conceptual extensions of this thesis' theoretical model.

The contribution of this thesis to practice is significant to valuers, family-owned firm owners, and standard setters. For valuers, this thesis identifies a multitude of issues that have to be considered when valuing a family-owned firm. While an overarching

solution or valuation model is not intended, the knowledge of the specific issues in family-owned firm valuation will allow for more holistic and informed valuations. Knowledge of the impact upon the reliability of accounting information reported provides an indication of how useful they may be, and if family-owned firms do have a different level of unidentifiable intangible assets then that will have to be considered in the valuation process. Family-owned firm owners will, on the other hand, be more informed about how their involvement adds or detracts from the financial value of the firm. Through a deeper understanding of this relationship, family-owned firm owners can put value-adding strategies into place. Additionally, it also allows more informed decisions to be made at times of divesture. Lastly, this research is of interest to standard-setters, as this thesis provides further empirical tests of the shortcomings of accounting information, specifically the inability to accurately portray the intangible assets of a firm. While research has shown that certain industries have specific issues with non-accounted intangible assets, ownership has not been considered a driving factor.

Finally, in regards to education, this thesis contributes to both accounting and family business education. For accounting education, and specifically to teaching of valuation, this thesis highlights the important role of qualitative issues in valuation. Teaching accounting students the nuances of valuation, rather than taking a mechanical approach, builds foundations for better future valuations in the marketplace. Furthermore, there has been a steady rise in interest in family business education. This trend has resulted in standalone subjects and even complete academic programs being taught in the field. This thesis enables students to understand how financial value of a firm is impacted by family ownership, and allows them to better perform in the future, either as consultants or as family-owned firm leaders.

1.6 ORGANIZATION OF THE THESIS

Chapter 2 reviews the literature that is important for this thesis. The value-relevance and family-owned firm literature is reviewed and the links between family ownership and value-relevance emerge and are transformed into propositions.

Chapter 3 provides the research design for this thesis. Specifically, this chapter provides the operationalization constructs and propositions that are discussed in Chapter 2.

Chapter 4 provides the results of this thesis. Furthermore, the results are subjected to robustness testing to ensure they are statistically valid. Additionally, the important constructs in this thesis are subjected to sensitivity testing to ensure that the results are not sensitive to alternative operationalizations of the constructs.

Chapter 5 provides the discussion and conclusion for this thesis. Specifically, it integrates the theoretical developments with the results and discusses the consistencies and inconsistencies of the theory and the empirical results, while taking into account prior research evidence. Finally, the limitations, future research opportunities and contributions of the findings are presented.

Chapter 2: Development of Propositions

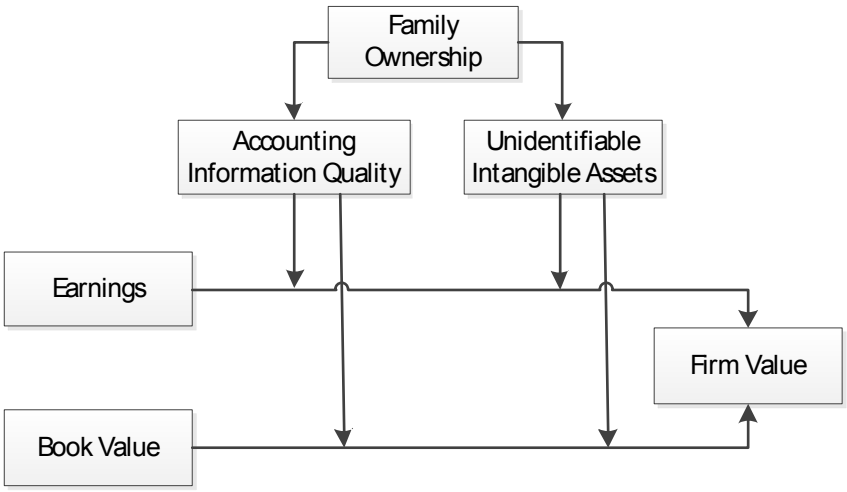
This chapter explores the research question and thus the relationship between family ownership, accounting information characteristics, and the value-relevance of accounting information. It reviews and synthesizes the pertinent prior literature. The first section provides an overview of the theoretical links and propositions that are presented in this chapter and is a road map for the reader to go through this chapter. The second section provides a justification for investigating value-relevance from a normative accounting perspective by a reviewing the IFRS conceptual framework and the objective of financial reporting. The third section provides an overview of value-relevance research and how it has been developed as an empirical test for the decision-usefulness of accounting information. Furthermore, the research surrounding the value-relevance of earnings and book value is explored. This section also discusses how the qualitative characteristics of accounting information moderate the value-relevance of earnings and book value, the two primary accounting summary measures. The fourth and final section provides an overview of family ownership and its distinctiveness. This section also explores how family ownership impacts the value-relevance of accounting information. It is proposed that family ownership is related to the qualitative

characteristics of accounting information. Specifically to accounting information quality (*faithful representation*) and the level of unidentifiable intangible assets in a firm (*relevance*), both of which impact the value-relevance of accounting information.

2.1 OVERVIEW OF THEORETICAL LINKS

Figure *2-1* provides a graphical overview of the primary theoretical links and propositions that will be developed in this chapter.

Figure 2-1 Primary theoretical links



The underlying notion is that the two primary accounting information measures of earnings and book value are related to firm value and are thus value-relevant. According to the IFRS conceptual framework, for information to be useful it has to be *faithfully represented*. This is supported by empirical research conducted by Marquardt and Wiedman (2004) and Whelan and McNamara (2004). Thus, this thesis asserts that accounting information quality moderates the relationships between earnings and firm value, and book value and firm value. The IFRS conceptual framework also states that for information to be useful it has to be *relevant* for the decision-maker and thus can impact their decisions. As we move from a physical capital economy to a knowledge

economy the intangible assets within a firm are often their most important assets (Goldfinger, 1997; Hand & Lev, 2003), yet most of these intangible assets are not present in the measure of book value and costs associated with developing them are expensed instead of capitalized (Cañibano et al., 2000). Both theoretical and empirical research has noted that this presents a threat to the *relevance* of accounting information as it decreases its usefulness for decision-makers (Amir & Lev, 1996; Hasso & Duncan, 2012; Lev, 2001). Consequently, this thesis asserts that the level of unidentifiable intangible assets within a firm moderates the relationships between earnings and firm value, and book value and firm value.

Finally, this chapter introduces the distinct agency context of family ownership and discusses its distinctiveness as it relates to the qualitative characteristics of accounting information. Specifically, how family ownership impacts accounting information quality and the accumulation of unidentifiable intangible assets. It is proposed that family ownership may impact these two moderators of value-relevance. While it is suggested that the traditional owner-manager agency conflict, *Type I* agency problem, is mitigated in publically listed family-owned firms, there are also potential downsides of family ownership (Anderson et al., 2003; Demsetz & Lehn, 1985; Villalonga & Amit, 2006). The concentration of ownership and management in these firms may lead to *Type II* agency problems. Furthermore, family ownership is related to the level of unidentifiable intangible assets in firms, as the family places a different importance weight upon non-financial goals and consequently increasing social capital and human capital (Hasso & Duncan, 2012; Miller et al., 2008; Sirmon & Hitt, 2003).

In summary, it is suggested that family ownership is related to the value-relevance of accounting information through its relationship to the qualitative characteristics of accounting information. These qualitative characteristics are accounting information

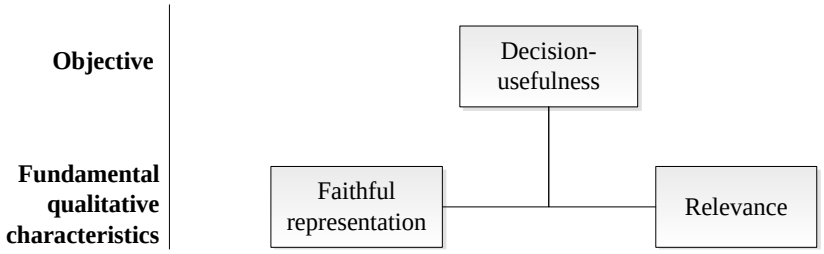
quality (*faithful representation*) and unidentifiable intangible assets (*relevance*). This chapter will now explore these issues in greater detail, starting with an overview of the IFRS conceptual framework and its importance to the theoretical development in this chapter.

2.2 IFRS CONCEPTUAL FRAMEWORK

The IFRS conceptual framework provides a normative theory of the purpose of accounting information and financial reporting. This theory promotes consistency in financial reporting by using the collective reasoning of accountants to reach a consensus on the objectives of accounting information. The conceptual framework states that the decision-usefulness of accounting information is one of the primary objectives of financial reporting. Specifically, the framework suggests that present and potential investors are amongst the primary users of financial reports, and use the information in these reports to aid them in making decisions about buying, selling or holding equity (IASB, OB 2). This includes information about an entity's resources and claims (IASB, OB 13), and changes therein due to the entity's financial performance (IASB, OB 15). This theory provides justification and support for the importance of accounting information in the valuation process.

The framework suggests that to achieve decision-usefulness, accounting information must possess certain qualitative characteristics. Specifically, it states that the two fundamental qualitative characteristics of useful information are *faithful representation* and *relevance* (see *Figure 2-2*). For financial information to be decision-useful it has to *faithfully represent* (formerly known as reliability) the underlying economic phenomena and be *relevant* for users (IASB, QC 4).

Figure 2-2 Qualitative characteristics of accounting information



The first[2] fundamental qualitative characteristic, *faithful representation*, is met when the economic phenomena is *faithfully represented* in words and numbers. This characteristic encompasses the underlying characteristics of the information, including *completeness* in terms of sufficient information (in the notes) to judge an estimated measure, *neutrality* in terms of it being neutral and not manipulated by managers or other employees, and *freedom from material error* (IASB, QC12). The second fundamental qualitative characteristic, *relevance*, is met when the financial information can impact decisions by providing *predictive value*, *confirmatory value*, or both (IASB, QC6-QC10).

These two fundamental qualitative characteristics are central to this thesis. *Faithful representation* can be seen as the higher-order construct for the empirical work on accounting information quality (earnings management and earnings quality) (Dechow et al., 2010). *Neutrality* is one of the components of *faithfully represented* information. When management manipulates earnings and book values through the accruals process, it decreases the *neutrality* of the reported figures.

The notion of *relevance* can be linked to research on unidentifiable intangible assets (Lev, 2001). Specifically, it is suggested that increases in unidentifiable

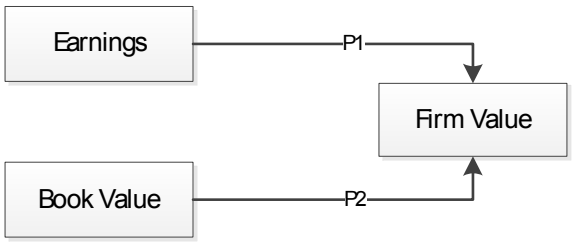
[2] The order in which these qualitative characteristics are mentioned does not imply their relative importance. Furthermore, the conceptual framework mentions *relevance* before *faithful representation*, but for the purposes of this thesis the order in which they are mentioned is reversed to improve the clarity of the argument being made.

intangible assets impacts the *relevance* of accounting information as the book value measure does not account for these assets. This decreases the predictive value of book value, as predictions are based on measures that do not account for some intangible assets and are noisy (Amir & Lev, 1996). In summary, the IFRS conceptual framework provides initial support for this thesis' conceptual model that asserts that the qualitative characteristics of information moderate the value-relevance of accounting information. Next, value-relevance is explored in detail.

2.3 VALUE-RELEVANCE OF EARNINGS AND BOOK VALUE

This section outlines the underpinnings of value-relevance research and provides the support for propositions 1 and 2 (P1 and P2), that both earnings and book value are related to firm value. This relationship is depicted in *Figure 2-3*.

Figure 2-3 Earnings, book value, and firm value



The normative conceptual framework sets forth that the decision-usefulness of accounting information is one of the primary objectives of financial reporting. Value-relevance research is the empirical assessment of the decision-usefulness of financial information and is a joint test for the fundamental qualitative characteristics of *faithful representation* (formerly known as reliability) and *relevance* (Barth et al., 2001). The origin of value-relevance research, and specifically the value-relevance of earnings, can be traced back to the seminal study of Ball and Brown (1968). The authors investigated

the relationship between earnings announcements and abnormal returns in the months around the announcement. They concluded that while the earnings figure was informative, containing more than half of all value-relevant information about the firm, it was not timely; up to 90 per cent of the content was captured before the actual earnings announcement. This suggests that earnings have confirmatory rather than a predictive role in decision-making. Thus, while the earnings announcements in most cases do not lead to shocks in market values, there appears to be a strong post-earnings announcement drift in cases of unexpected negative earnings. These core findings were also supported by Beaver's (1968) seminal article that investigated the relationship between earnings announcement and the trading activity of stocks. Beaver (1968) shows that the trade volume of stocks increased dramatically in the week of an earnings announcement. Additionally, he found that the stock price changes in the week of reporting were of a higher magnitude in comparison to non-reporting trading weeks. However, the concept of value-relevance only emerged in the work of Amir et al. (1993). Thus, while the origins and the foundation were laid in the 1960's and thereafter, the majority of the value-relevance work, as we know it today, is predominantly based on research from the past two decades.

For accounting information to be deemed as useful for equity investors, there has to be an association between reported accounting information and market values (Francis and Schipper, 1999). This association can be of a direct or indirect nature. Thus, if accounting information is deemed as non-useful for equity investors, one of the primary purposes of financial reporting would not be met. Under this view, accounting information is deemed as value-relevant if there is a statistical association to market values of returns. This view can be formally stated as:

$$firm\ value = f(accounting\ information) \quad (1)$$

This function does not specify the exact line items that are used in valuation but the focus of value-relevance studies has been the earnings and book value and the components thereof (Kothari, 2001). This focus can be traced to the dominance of the Ohlson (1995) framework for valuation that states that a firm's equity value is equal to the book value of equity plus the discounted value of future residual income. Formally, the model is stated as follows:

$$P_t = BV_t + \sum_{t=1}^{\infty} \frac{NI_t - k_e * BV_{t-1}}{(1+k_e)^t} \quad (2)$$

where P is the firm value, BV the book value of the equity, NI the net income, and k_e the cost of equity capital. The residual income is thus equal to a firm's net income minus the required rate of return of the book value of equity. Based on this framework, the central focus of the value-relevance literature becomes to assess the significance level and explanation power of earnings and book values for variation in stock prices. The formal model for testing this view is the following:

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \varepsilon_{j,t} \quad (3)$$

where P is the price per share for firm j at fiscal year-end t plus 3 months, EPS is earnings per share for firm j at year t, and BVPS is book value per share for firm j at year t. Researchers often decompose this model and investigate the value-relevance of earnings and book value of equity separately as follows:

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \varepsilon_{j,t} \quad (4)$$

$$P_{j,t} = \beta_0 + \beta_1 BVPS_{j,t} + \varepsilon_{j,t} \quad (5)$$

Models (4) and (5) are applied in research to investigate the incremental value-relevance of each component. By comparing the explanation power of model (3) to the explanation power of models (4) and (5), the incremental value-relevance of the earnings and book value of equity can be estimated. Furthermore, model (4) is also used in research investigating the earnings response coefficient, specified as β_1 in this model.

Researchers have also investigated the changes in each component and how they explain the change in firm value. This is referred to as price return specification or changes model. However, as Barth et al. (2001) note, the price return specification does not determine what is reflected in the value of a firm, merely what drives changes in value. Furthermore, the changes model does not suit studies that focus on book value as the changes model is usually dominated by earning changes (Hung, 2000). As the primary theoretical links presented in this chapter suggest that intangible assets are major sources of firm value, the price levels specification is of primary interest. The price levels specification is able to capture both the importance of earnings and book value in the valuation process.

When using the price levels specification, the two primary concerns of researchers investigating the value-relevance of earnings are the explanatory power of model (4) and the magnitude of the earnings response coefficient in the model (β_1). The fact that earnings are value-relevant is generally accepted amongst researchers at present (Collins et al., 1997), and thus provides the first proposition of this thesis.

Proposition 1: There is a positive relationship between earnings and firm value.

Nevertheless, while the consensus is that earnings are indeed value-relevant, researchers have found a number of factors that impact the relationship between earnings and firm value; earnings persistence (Kormendi and Lipe, 1987), the timeliness of earnings (Collins et al., 1994), and conservative accounting (Basu, 1997). These

researchers highlight the importance of not only focusing on the magnitude of earnings but also on the nature of the earnings number and how it is determined through measurement and discretionary accounting choices.

The majority of the research within value-relevance has historically focused on the earnings component. This can be explained by the market's tendency to focus on profits and returns (Collins et al., 1997). In addition, the stable nature of book value of equity makes it of lesser interest for researchers adopting price return specifications for investigating value-relevance (Barth et al., 1998b). Thus the majority of the research investigating the value-relevance of book values uses a price level specification model of value-relevance (Barth et al., 1998b).

Many studies investigate the association between book value of equity and firm value (Ayers, 1998; Barth et al., 1998; Collins et al, 1997; Dechow et al., 1999; Ohlson and Penman, 1992). In general, these researchers agree that book values are indeed value-relevant and have a high explanatory power for firm values. This notion leads to the second proposition of this thesis:

Proposition 2: There is a positive relationship between book value and firm value.

The explanatory power of book value does, however, depend on the nature and state of the firm. For example, firms that are not profitable, either having very low or negative earnings are often valued solely based upon their book value (Basu, 1997; Block, 1995). Furthermore, value-relevance models using level specification are considered to be more theoretically sound; if we consider a case of liquidation, a firm that has no foreseeable earnings will still be of some value if it has physical or intangible assets (Shleifer & Vishny, 1992).

The value-relevance of book value is also sensitive to the rules and principles applied in the valuation of the assets and liabilities that make up book value. Consequently, a number of studies have compared the usage of historical cost accounting to fair value accounting, and the impact this has upon the value-relevance of book values (Barth et al., 1996; Carroll et al., 2003). In general, the consensus amongst researchers is that fair value accounting increases the value-relevance of book values. However, Khurana and Kim (2003) note that this increase in value-relevance only exists when the fair value accounting estimates are based on objective market-determined measures. Additionally, Hahn et al. (2007) find that while there is merit in using fair value accounting, the value-relevance of earnings may be negatively impacted through a higher prevalence of transitory gains and losses under fair value accounting.

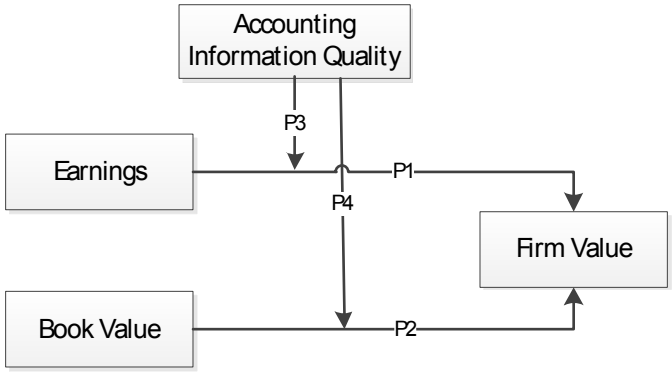
Researchers have established that both earnings and book values are value-relevant. Their relative importance is, however, conditional upon the state of the firm. Furthermore, the characteristics and nature of the earnings and book value measurements may also impact the usefulness of these two measures for valuation purposes. The following section explores how the qualitative characteristic of accounting information quality may moderate the usefulness of both earnings and book value.

2.3.1 VALUE-RELEVANCE AND ACCOUNTING INFORMATION QUALITY

The qualitative characteristics and nature of reported information has an impact upon its value-relevance. This section provides the arguments for propositions 3 and 4 (P3 and P4); that accounting information quality (*faithful representation*) moderates the relationship between earnings, book value, and firm value. This relationship is depicted in *Figure 2-4*. There has been a growing interest in the intersection between accounting

information quality and value-relevance research (Christensen et al.,1999; Marquardt & Wiedman, 2004); this research criticises prior work for assuming that accounting information reported by different firms is of homogenous quality. In contrast, these authors suggest that as accruals are subject to judgments by management, there is opportunity for manipulation and bias.

Figure 2-4 Moderating role of accounting information quality



Marquardt and Wiedman (2004) contend that due to the incentive structure in firms, management engage in opportunistic behaviour to manipulate earnings. In turn, this impacts the reliability of the earnings figure and thus the usefulness of the figure for valuation purposes, consequently decreasing the value-relevance of earnings. Christensen et al. (1999) support this view and find a negative relationship between the incentives for earnings management and the information content of earnings. Whelan and McNamara (2004) provide further insights by decomposing earnings management into two components, short-term discretionary accruals and long-term discretionary accruals. The authors find that although earnings management is value-relevant, earnings management via long-term discretionary accruals has a greater impact upon the value-relevance of earnings and book value compared to earnings management via short-term discretionary accruals. Together, these studies provide support for the third proposition of this thesis:

Proposition 3. The relationship between earnings and firm value is positively moderated by accounting information quality.

While the subjective and judgmental nature of accounting provides opportunity for earnings management, the negative impact upon value-relevance of earnings exists only when there are incentives for management to manage earnings. In contrast, the subjective nature of accounting and the accrual process can provide a more timely and accurate portrayal of firm performance, and thus increase the value-relevance of earnings (Bao & Bao, 2004; Guay et al., 1996). As such, the accrual process gives managers the discretion to either increase or decrease the quality of the earnings figure. The motivations of management, as theorized through agency theory are thus of the utmost importance. Therefore, a shift in the traditional agency relationship, such as in the case of family ownership, may have a significant impact upon accounting information quality. This issue will be discussed in greater detail later in this chapter (see section 2.4.1).

The value-relevance of earnings is also influenced by the persistence of earnings. If earnings are considered to be permanent then the market will consider them to be more value-relevant and thus assign a greater weight to them in contrast to transitory earnings (Kormendi and Lipe 1987; Sloan 1996). Similarly, the value-relevance of cash flows is related to earnings persistence. When the market considers the earnings figure transitory, the value-relevance of cash flows increases, and hence it can be seen as an alternative information source for the market (Cheng et al., 1996). Thus, while earnings have been established as value-relevant, there are conditions where their value-relevance will either increase or decrease. In such conditions, the market may use book value for valuation purposes. Therefore, while accounting information quality will primarily moderate the relationship between earnings and firm value, it will also

moderate the relationship between book value and firm value. A firm that provides low quality accounting information will most likely be valued more so upon their book value, as investors will see the book value as the guaranteed value while seeing the reported earnings as easily manipulated and unreliable (Marquardt & Wiedman, 2004; Whelan & McNamara, 2004). This provides the fourth proposition for this thesis:

Proposition 4. The relationship between book value and firm value is moderated by accounting information quality.

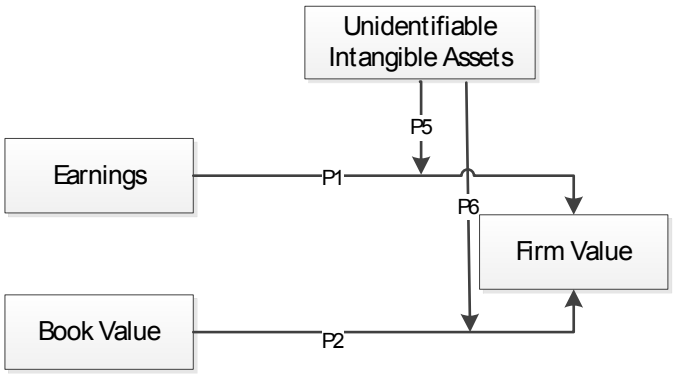
Thus accounting information quality has a moderating effect on both the value-relevance of earnings and book value. However, accounting information quality represents only one of the two fundamental qualitative characteristics of useful accounting information as described by IFRS, namely *faithful representation*. The second characteristic of *relevance* as operationalized by unidentifiable intangible assets is discussed and explored in the next section.

2.3.2 VALUE-RELEVANCE AND UNIDENTIFIABLE INTANGIBLE ASSETS

Lev and Zarowin's (1999) 20-year longitudinal study found that the value-relevance of accounting information in general is steadily decreasing.[3] This effect is observed for both earnings and book value. The authors attribute the loss in value-relevance to the shortcomings of the accounting standards to account for intangible assets. This section provides the arguments for propositions 5 and 6 (P5 and P6): that the level of unidentifiable intangible assets moderates the relationship between earnings, and book value and firm value. This relationship is depicted in *Figure 2-5*.

[3] This effect is for a 20-year period and authors recognize that others have found an increasing effect over the past 40 years (Collins et al., 1997; Francis & Schipper, 1999). However, Lev and Zarowin (1999) contend that the increase in value-relevance is only observed for the first half of the 40-year period, and a decline in the last 20 years.

Figure 2-5 Moderating role of unidentifiable intangible asets



The importance of intangible assets has grown in the last two decades and they are now considered to be the primary source of value, representing a shift from the traditional physical assets value dominance (Goldfinger, 1997; Hand & Lev, 2003; Lev, 2001). The term intangible asset is broad and encompasses a variety of assets that do not have a physical substance. Lev (2001) provides an overview of common intangible assets and the various ways researchers have attempted to group them based on their characteristics. For the purpose of this thesis, two groups of intangible assets are of special interest due to their prevalence in family-owned firms. These are social capital and human capital (Sirmon & Hitt, 2003). Social capital is comprised of the firm's relationships with its customers and suppliers and could thus be seen to encompass the firm's brand and reputation, while human capital refers to the skills and knowledge of the firm's employees that could be used to benefit the firm (Sirmon & Hitt, 2003). The common factor between these two groups of intangible assets is that they are both not accounted for in financial statements. Lev and Zarowin (1999) suggest that the failure of accounting to account for these intangible assets has made financial information less useful for valuation purposes, consequently decreasing the value-relevance of accounting information.

To recognize an intangible asset in the accounts, the resource or asset must: (1) be under the control of the firm and the firm has to be able to obtain the benefits of owning the asset, (2) embody future economic benefits associated with the control of the asset either in the form of increased revenue or decreased expenses, and (3) be identifiable (IAS 38).

The third test of identifiability is the critical stumbling when it comes to recognizing most intangible assets. To consider an asset identifiable, the firm must be able to separate the asset from the firm. Separability, in this respect, means that the benefits of controlling the asset can be transferred to a third party, for example, in the form of selling or renting the asset (Bond et al., 2000). If we consider the case of social capital and its reputation subcomponent, while there may be future economic benefits stemming from a positive reputation, the firm's reputation cannot be severed from the firm itself (Cañibano et al., 2000). This disqualifies reputation from being an intangible asset for accounting measurement.

However, while some suggest that accounting standards have failed to accurately account for intangible assets, others have attempted to proxy for these intangible assets in order to investigate their importance for investors. Barth et al. (1999) investigated the value-relevance of brand value and used the estimated brand valuations of *Financial World* as a proxy for the brand value. The authors found that brand values are value-relevant as there is a statistical association between brand values and market values, and that brand values provide incremental explanation power beyond what can be explained by earnings and book values. Similarly, researchers have also investigated the value-relevance of human capital by using employee training expenditure as a proxy for human capital. Both Hand (1998) and Backer et al. (1999) found that human capital, proxied by employee training expenditure, is value-relevant and provides incremental

explanation for market values beyond what can be explained by earnings and book value.

These studies show that the market partially incorporates the value of these intangible assets. However, if investors are relying more heavily upon non-financial information, what does this mean for the usefulness of accounting information and accounting itself? According to Cañibano et al. (2000), the shortcomings of the standards to account for intangible assets have made financial information less useful for valuation purposes in general. While the authors highlighted the impact on book value, they also considered the role of earnings and how expensing the development cost of the unidentifiable intangible assets has made earnings less value-relevant as well; this view is also seen in the work of Stewart (1997). Indeed, if these unidentifiable intangible assets are significant and considered valuable by investors, the omission of these from the book value of the firm would make this measure less useful to predict or confirm firm value. Furthermore, the development of these unidentifiable intangible assets is generally associated with large expenditures for training employees and building relationships with customers and suppliers. As the outcomes of these expenditures are not seen as legitimate intangible assets, the costs associated with their developments are expensed rather than capitalized. This practice may then decrease the usefulness of both the earnings and book value measures, and it leads to propositions five and six:

Proposition 5. The relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets.

Proposition 6. The relationship between book value and firm value is moderated by the level of unidentifiable intangible assets.

Having explored the moderating impact of unidentifiable intangible assets the remaining question becomes: how does family ownership fit in this picture?

2.4 FAMILY OWNERSHIP

When a family has an ownership stake in a firm and is able to shape its strategic direction, the firm is said to be a family-owned firm (Chua et al., 1999). In these firms, the principal and the agent often belong to the same family (Anderson & Reeb, 2003). This is a distinct agency context in contrast to traditional widely-held firms, where owners are separated from management. This chapter has proposed that accounting information quality and unidentifiable intangible assets moderate the value-relevance of accounting information. This section and its subsections (2.4.1 and 2.4.2) propose that due to the unique agency context, family ownership is related to both accounting information quality and unidentifiable intangible assets. However, before exploring these relationships in detail, agency theory itself is explored to identify how it relates to family ownership.

In academia, agency theory was recognized in the 1970s following the seminal work of Jensen and Meckling (1976), Alchian and Demsetz (1972), and Ross (1973). However, while it was not until the 1970s that agency theory evolved in a formal sense; the core thesis of the theory has been of interest since the 1700s. Smith (1776) can be seen as the grandfather of agency theory, as the author was the first to note the importance of separation between owners and managers in publicly held companies. At that time, publicly held companies were a growing business structure; however, Smith (1776) theorized that these companies would probably not stand the test of time, except in certain conditions. The primary reason for his argument was that managers in these firms were self-interested and unless actively monitored, they would not act in the best interest of the owners. Therefore, according to Smith (1776) these firms would not be

economically feasible and would most likely disappear except in certain industries. However, Smith (1776) did not consider the role of families in these firms. Most of the large firms at that time were family-owned firms, where the family had control of the firm through significant ownership and thus appointed managers affiliated with the family. As such, Smith's (1776) prediction remains unrealized, at least for the time being.

In the early 1900s many of the large firms had grown so much that it was not possible to only appoint family members as managers. Furthermore, some heirs were not interested in the active management of the firm and hired outside managers to oversee the operations. Thus, when the depression of the 1920s caused widespread economic devastation, there were questions regarding what caused the markets to fail and whether the conditions for the governance of these firms were to blame. This investigative trend can be seen as the tipping point for agency theory.

Berle and Means (1932) revisited the discussion started by Smith, and provided regulators with a plausible scapegoat. Berle and Means (1932) repeated the arguments of Smith regarding the problem of separation of ownership and control. They stated that the conditions present in publicly held firms provided managers with the opportunity to act in self-interest to the detriment of shareholders. Consequently, they argued that there needed to be formal and reliable channels through which owners could monitor and evaluate the performance of managers. This view was accepted by many and resulted in the revision of the Securities Act of 1934 and the Securities Exchange Act of 1934. The enactment of these legislations can be seen as the birth of corporate governance as we know it today.

While the work of Berle and Means (1932) is seen as seminal in agency theory, the notion of agency theory was not formalized until the 1970s when Jensen and

Meckling (1976) published *Theory of the Firm*. In this seminal piece, the authors provided the framework for agency theory, which outlines the issues in relationships between principals (owners) and agents (managers). Namely, the authors stated two primary problems that occur in agency relationships. The first agency problem (Type I) arises when the interests and goals of the two parties do not align, especially under circumstances in which it is hard for the principal to monitor the agent's actions. The second problem (Type II) arises from the potential differences in risk-aversion between the two parties. These two problems are the two primary threats to the viability of publicly held firms. These threats can, however, be managed by aligning the interests between principals and agents and thus reducing the associated costs of the agency relationship. One of the fundamental ways to align the interests of the two parties is to ensure that managers have an ownership stake in the firm. According to Jensen and Meckling (1976) the agency problem is virtually eliminated in situations when the firm is managed by a single owner. Consequently, agency theory has become a focal source for distinguishing the family-owned firm, where there is often an overlap between owners and managers.

Drawing upon agency theory, research has identified two competing effects of family ownership on the firm: the alignment effect (typical Type I agency conflict) and the entrenchment effect (typical Type II agency conflict) (Wang, 2006). The alignment effect proposes that the interests between principals and agents are better aligned within family-owned firms and thus the agency issues are minimized (Bhaumik and Gregoriou, 2009). This alignment results partially from the fact that the family often appoints members of the family to senior management positions, thus naturally aligning the interests of the firm and the owners (Wang, 2006). The family's investment in the firm may also reduce any short-termism in the firm. As the family has a long-term interest in

the firm, the practices and strategy of the firm may be more inclined towards activities that maximise long-term wealth rather than short-term profits. However, the family could also have negative effects on the firm, according to the entrenchment effect (Wang, 2006). In situations where the family-owned firm has outside equity investors, the family may itself act opportunistically and attempt to expropriate assets from the firm to the detriment of minority shareholders. The family then attempts to maximize their own wealth rather than the wealth and value of the firm itself (Fan & Wong, 2002). Overarching these two opposing effects is the legal environment in which the firm operates (Setia-Atmaja et al., 2011). A country's legal system and investor protection regulation may deter entrenchment behaviour, as the family may be fearful of legal and financial repercussions.

Using this agency framework and the two competing effects of alignment and entrenchment, this thesis investigates how family ownership may impact the qualitative characteristics of accounting information and therefore its value-relevance. To date, value-relevance research has focused primarily on widely held firms and in some cases managerial ownership (See Warfield et al. (1995) and Gabrielsen et al. (2002)). Two studies explicitly investigate value-relevance and do so in a family ownership context, however the institutional settings of these two studies and their methodological flaws make it hard to generalize these results to all family-owned firms as a group (Bae & Jeong, 2007; Cascino et al., 2010). The recent study by Bae and Jeong (2007) was based on a South Korean sample, and focused on large business conglomerates (chaebols), which often are controlled by families. In line with their hypothesis, the authors found that the value-relevance of accounting information was lower for these firms; they attribute this loss in value-relevance to the lower quality of accounting information supplied by chaebols. However, even though families often control these chaebols, the

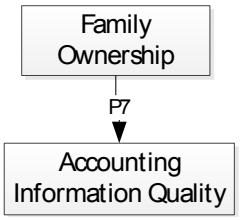
distinct institutional and cultural setting makes it hard to generalize these results. Furthermore, Cascino et al. (2010) investigated the value-relevance of earnings and compared family and non-family-owned firms in the Italian context. The authors found that the earnings of family-owned firms were more value-relevant. However, as the authors did not control for firm-specific characteristics such as size, growth, leverage, or industry, the results of this study are not conclusive. Beyond the issue of methodology, the institutional and cultural issues in Italy are quite unique, making it hard to generalize from the Italian results (La Porta et al., 1999).

In summary, this section explored the nature of family-owned firms and the essence of their distinctiveness. The overlap between owners and managers is central to their distinctiveness as the separation between these two parties lies at the heart of corporate legislation and corporate governance, as we know it today. Furthermore, the current body of knowledge about family ownership and its association to value-relevance is sparse, and thus provides the motivation for this thesis. With this in mind, this thesis continues by exploring the relationships between family ownership and accounting information quality (*faithful representation*), and the level of unidentifiable intangible assets (*relevance*).

2.4.1 FAMILY OWNERSHIP AND ACCOUNTING INFORMATION QUALITY

Drawing upon agency theory, this section uses the two competing effects of alignment and entrenchment to propose that there is a relationship between family ownership and accounting information quality (*faithful representation*). This leads to proposition 7 (P7), which is depicted in in *Figure 2-6.*

Figure 2-6 Family ownership and accounting information quality



The unique agency context of family ownership has the potential to diminish Type I agency conflicts by aligning the interest between owners and managers and exerting greater managerial monitoring. In family-owned firms, the family members often hold senior positions, potentially eliminating the Type I agency conflicts (Bhaumik and Gregoriou, 2009) as alignment exists between owners and managers. However, even in cases where the family uses a professional manager, the undiversified nature of the family's investment portfolio incentivises them to carefully monitor the manager and decrease the incentive for opportunistic management behaviour (Prencipe and Bar-Yosef, 2011). Anderson et al. (2003) found that family-owned firms are able to derive a lower cost of debt; this finding indicates that bond-holders prefer the governance provided by families. As the interests of the owners and managers are aligned, there exists less possibility for earnings management and the potential for managers to extract benefits from the firms to the detriment of shareholders. This should theoretically lead to an increase in the value-relevance of accounting information for family-owned firms, as investors would consider the reported information *neutral* and consequently *faithfully represented.*

There is, however, a body of literature to argue that concentrated ownership may lead to an increase in Type II agency conflicts through the entrenchment effect (Morck et al., 1988; Schleifer & Vishny, 1997). In these situations, the controlling shareholders have an opportunity to expropriate wealth from minority shareholders. The controlling

families may be entrenched, self-interested, and reporting accounting information that is of benefit to them, thus making the accounting information lose credibility amongst outside investors (Fan and Wong, 2002). If accounting information is not seen as *neutral* and credible by outside investors then its use in decision making would decrease, causing its value-relevance to diminish. In these cases, outside investors would in effect price-protect and punish the family-owned firms that expropriate from minority shareholders (Jensen et al., 1976). Thus, it becomes important for a family-owned firm to communicate and signal that they are not engaging in expropriation by having transparent and sound governance.

Given this interesting agency setting, there has been some empirical research conducted in this area. The empirical research uses accruals quality models to detect earnings management and consequently accounting information quality. Prior studies have found conflicting evidence regarding this agency context, with studies from the US showing a positive relationship between family ownership and accruals quality (Ali et al., 2007; Wang, 2006), while some non-US studies show a negative relationship (Kim & Yi, 2006; Prencipe et al., 2008; Yang, 2010). Furthermore, Setia-Atmaja et al. (2011) investigate the issue in the Australian context and find that family-owned firms, on average, have lower quality accruals. However, the model used by Setia-Atmaja et al. (2011) to measure accruals quality has been criticized for not appropriately distinguishing accruals arising from fundamentals of the firm and the accruals that arise from discretionary choices by management (Aboody et al., 2005; Francis et al., 2005; Schipper & Vincent, 2003). This criticism is applicable to the majority of studies that have investigated the relationship between family ownership and accounting information quality. These studies often rely on a single accrual quality model even though there is extensive research that disputes the validity of such models (Aboody et

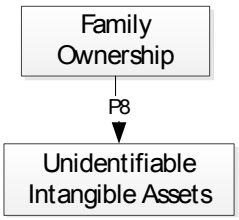
al., 2005; Francis et al., 2005; Schipper & Vincent, 2003). Furthermore, portions of accruals arise from the fundamentals of the firm rather than by earnings management. The models that have been employed in the past often fail to distinguish the innate component from the accruals measures, making them noisy in estimating the true discretionary accruals that could be attributed to earnings management (Francis et al., 2005). As agency theory and empirical evidence provides conflicting views on the effects of family ownership upon accounting information quality, a non-directional relationship is proposed:

Proposition 7: There is a relationship between family ownership and accounting information quality.

2.4.2 FAMILY OWNERSHIP AND UNIDENTIFIABLE INTANGIBLE ASSETS

This section provides the arguments leading to proposition 8 (P8): that there is a relationship between family ownership and the level of unidentifiable intangible assets (*relevance*). This relationship is represented in *Figure 2-7*. Research has shown that family-owned firms have a long-term orientation, in that they do not chase short-run returns at the expense of long-term gains (James, 1999). This long-term orientation impacts the firms' goals and behaviours and, in turn, the development of unidentifiable intangible assets.

Figure 2-7 Family ownership and unidentifiable intangible assets



The discussion leading to this proposition can be framed using the alignment effect within agency theory and can be explained through a stewardship theory lens (Davis et al., 1997; Donaldson, 1990; Donaldson & Davis, 1991). Recently, it has been applied within the family business context (Arregle et al., 2007; Gomez-Mejia et al., 2007; Miller & Le Breton-Miller, 2005). According to stewardship theory, due to the interdependency of the family and its business, family members share a stronger connection to the firm versus non-family owners. This connection between the family and its business leads to managerial practices that differ from non-family businesses. One of the primary manifestations is the long-term orientation of the owners (James, 1999), the firm is managed with future generations in mind, often by CEOs whose job tenure greatly exceeds those of non-family-owned firms (Beckhard & Dyer, 1983). This connection with the firm and the long-term orientation has several implications for the level of unidentifiable intangible assets within the firm.

As the family has a deep connection with its business (Astrachan & Jaskiewicz, 2008) the family's social capital is often intertwined with that of the firm (Anderson et al., 2003), the permanence of the firm is equivalent to continuity of the family name. Consequently, family-owned firms place greater importance on social-capital-generating activities than non-family-owned firms. These include elements such as reputational development (Habbershon & Williams, 1999) and fostering relationships with the firm's customers and suppliers (Sirmon & Hitt, 2003). This notion is supported empirically by Miller et al. (2008), who found that family-owned firms have more personalized marketing, spend more on reputational development, and focus on markets that are often neglected. These activities are linked to future economic gains in prior research. A favourable reputation has been shown to improve financial performance (Roberts & Dowling, 2002) while customer satisfaction has been shown to be a lead

indicator of future performance (Ittner & Larcker, 1998). Additionally, it has also been shown that capital markets see brand values as an intangible asset Barth et al. (1998). However, family-owned firms also face challenges that may destroy the social capital of the firm. The most reported is the problem of rivalries within the company, which is especially pronounced in siblings who may attempt to gain control of the inherited company through legal battles and thus damage the reputation of the firm (Friedman, 1991; Tagiuri & Davis, 1996).

It has also been suggested that family-owned firms are more likely to perform human capital-increasing activities to ensure longevity than non-family-owned firms (Ward, 2004). Miller et al. (2008) showed that family-owned firms spend more on human capital-related activities than non-family-owned firms. These include training, wider job roles, flexible arrangements for work, and longer employment of individual managers. Human capital-related expenditure such as training has a positive impact on firm performance through productivity gains (Barbera & Moores, 2011; Bartel, 1994). Furthermore, the human capital of the firm is often described as the most important intangible asset (Hand & Lev, 2003). However, family-owned firms are also plagued with challenges that have a negative impact on the human capital of the firm. While family employees may show high commitment to the firm, this may come at the expense of resentment from non-family member employees. The possible glass ceiling for non-family members may have a detrimental effect upon their motivation (Casson, 1999). Furthermore, as the human resource pool within the family is limited, there exists the risk that underqualified family members may be promoted to positions in which they can damage the firm's wealth (Habbershon et al., 2003). In addition, some empirical research has shown that family firms may at times spend less on human resource management, as compared to non-family firms (Graves & Thomas, 2006; Kotey &

Folker, 2007; Reid & Adams, 2001). While it is true that non-family-owned firms also possess unidentifiable intangible assets (e.g. social capital and human capital), the level of unidentifiable intangible assets in family-owned firms may be of a different magnitude than it is for non-family-owned firms due to issues specific to family-owned firms that have been discussed in this section.

Empirical evidence that explores the relationship between family ownership and the level of unidentifiable intangible assets in specific is sparse (Hasso & Duncan, 2012). However, several inferences can be made by reviewing the research that investigates the relationship between family ownership and firm values. *Table 2-1* provides an overview of research that has investigated the impact of family ownership upon the firms Tobin's *q*, P/B ratios, and intangible assets. Interestingly, no published research has investigated the issue in the Australian context. International research has found that family-owned firms are usually valued higher in the market than non-family-owned firms, based on higher price-to-book (P/B) ratios as a proxy for Tobin's *q* values (Anderson & Reeb, 2003; Maury, 2006; Villalonga & Amit, 2006). However, if family-owned firms hold more unidentifiable intangible assets than non-family-owned firms, then their reported book values are relatively more understated (compared to the true underlying but unobservable state). A consequence of this understatement of book value is that the Tobin's *q* proxy P/B is biased since the denominator in the ratio is the reported (understated) book value of assets.

The argument that family-owned firms have a proportionally greater amount of unidentifiable intangible assets is supported by a body of literature that uses Tobin's *q* as a measure for resource intangibility (Sanchez et al., 2000; Villalonga, 2004). Industries such as information technology, where unidentified intangible assets are common, have higher Tobin's *q* ratios in comparison to industries where book values

reflect the true nature of the asset holdings (i.e. with more tangible asset bases) (Amir & Lev, 1996). Family-owned firm evidence of higher Tobin's *q* is thus consistent with the argument that family-owned firms have higher unidentifiable intangible assets. Evidence suggests that due to the nature of the intangible assets, the book values of family-owned firms are understated relative to their true underlying values (Hasso & Duncan, 2012).

Table 2-1 Family-owned firm research related to intangible assets

Author(s)	Sample period	Region	Sample	Main findings
Anderson & Reeb (2003)	1992–1999	U.S.	S&P 500	Family-owned firms are found to have higher Tobin's *q* compared to non-family-owned firms.
Cronqvist & Nilsson (2003)	1991–1997	Sweden	Stockholm Stock Exchange	Firms where the family is a controlling minority shareholder (CMS) have lower Tobin's *q* relative to non-family CMS.
King & Santor (2008)	1998-2005	Canada	613 publicly traded firms	Family-owned firms with control-enhancing mechanisms were associated with lower Tobin's *q* values than non-family-owned firms.
Martinez, Stohr, & Quiroga (2007)	1995-2004	Chile	Companies registered in Bolsa de Comercio de Santiago's database	Family-owned firms have lower Tobin's *q* values than non-family-owned firms. A subsample consisting of the 40 most traded firms shows the opposite effect.
Maury (2006)	1996–2003	13 countries in Western Europe	WorldScope 2003	Family-owned firms have higher Tobin's *q* values than non-family-owned firms.
McConaughy, Matthews, & Fialko (2001)	1986-1988	U.S.	Firms listed in 'The Business Week CEO 1000' in 1987	Family-owned firms have higher P/B ratios. Median P/B ratio for family-owned firms was 2.06, versus 1.42 for non-family-owned firms.
Miller, Le Breton-Miller, Scholnick, & Montreal (2008)	1995	Canada	676 small businesses with 100 or fewer employees	Family-owned firms engage in more reputational development, training of employees and relationship-building with customers.
Mishra, Randøy, & Jenssen (2001)	1996	Norway	Oslo Stock Exchange	There is a positive association between founding family control and firm value as measured by Tobin's *q*.
Pérez-González (2006)	1980–2001	U.S.	Firms in Compustat in 1994	Family-owned firms that appoint a family CEO as a successor have lower P/B ratios relative to firms that appoint a non-family member CEO.
Villalonga & Amit (2006)	1994-2000	U.S.	Fortune 500	Family-owned firms have higher P/B ratios than non-family-owned firms.

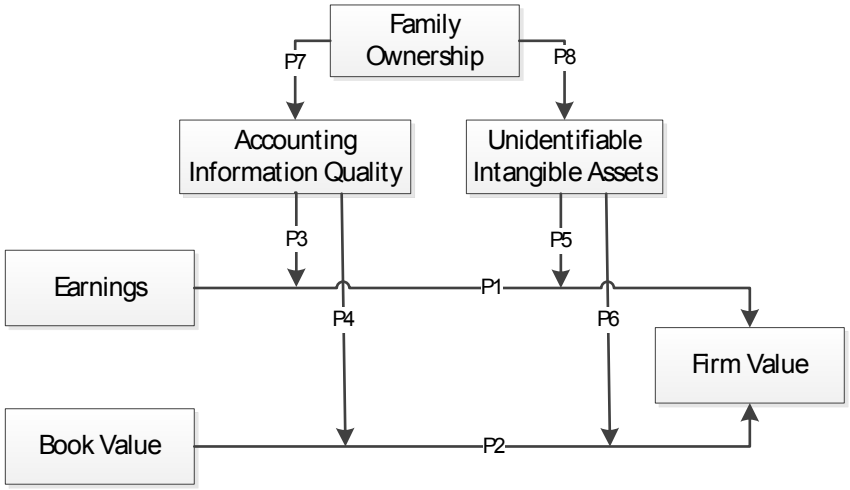
Based on the findings in this section and the insights from the prior research, it is proposed that there is a positive relationship between family ownership and the level of unidentifiable intangible assets:

Proposition 8: There is a positive relationship between family ownership and unidentifiable intangible assets.

2.5 SUMMARY

This chapter has provided the theoretical linkages between family ownership and the value-relevance of accounting information. *Figure 2-11* summarizes the proposed theoretical links in a visual format.

Figure 2-8 Summary of theoretical links



The underlying notion is that earnings and book value are related to firm value and are thus value-relevant. However, their value-relevance is moderated by the qualitative characteristics of accounting information quality and unidentifiable intangible assets. These moderators of decision-useful and thus value-relevant information have been established both from normative and positive lenses. The IFRS conceptual framework considers *faithful representation* and *relevance* as the

fundamental qualitative characteristics of decision useful information. These two qualitative characteristics overlap with the moderators found in empirical evidence. *Faithful representation* is the higher-order construct of accounting information quality, while the increase in unidentifiable intangible assets presents a threat to the *relevance* of financial statements. This chapter explored the relationship between family ownership and each of these issues. The research in the family-owned firm context has provided indications that there exists a relationship between family ownership and accounting information quality, and between family ownership and unidentifiable intangible assets. A summary of the developed propositions is presented in *Table 2-2*. These propositions will now be operationalized to hypotheses in Chapter 3.

Table 2-2 Summary of propositions

#	**Proposition**
P1	There is a positive relationship between earnings and firm value.
P2	There is a positive relationship between book value and firm value.
P3	The relationship between earnings and firm value is positively moderated by accounting information quality.
P4	The relationship between book value and firm value is moderated by accounting information quality.
P5	The relationship between book value and firm value is moderated by the level of unidentifiable intangible assets.
P6	The relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets.
P7	There is a relationship between family ownership and accounting information quality.
P8	There is a positive relationship between family ownership and unidentifiable intangible assets.

Chapter 3: Research Design

The purpose of this chapter is to describe and explain the research design used in operationalizing and testing the propositions developed in Chapter 2. The first section describes the sample that will be used in this thesis. The sample consists of firms listed on the Australian Stock Exchange between 2002 and 2006. The extensive continuous data requirements of the measures restricted the sample to 570 firms in total, of which 104 are identified as family-owned firms. The second section details the operationalization of the important constructs in this thesis. Specifically, the way this thesis operationalizes family-owned firms, value-relevance, accounting information quality and unidentifiable intangible assets. The third section operationalizes the propositions into hypotheses by using the operationalized constructs in the formulation of empirical models. Finally, the eight operationalized hypotheses and variables used across the empirical models to test these hypotheses are summarized.

3.1 SAMPLE

The sample consists of public firms listed on the Australian Stock Exchange between 2002 and 2006. Firms in the financial sector were excluded, as this is consistent with prior earnings management and value-relevance research (Kothari, 2001). The initial sample frame consisted of 2034 listed firms; however, as the accounting information quality measure requires eight years[4] of specific continuous data the sample was constrained to 570 firms. Of these firms, 104 or 18.25 per cent were identified as family-owned firms. These data restrictions may introduce survival bias to the results. However, as the surviving firms tend to be larger firms they may potentially have less variation in the independent variables. As such, the survival bias may manifest itself by the lack of significant relationships, as the variation is decreased (Francis et al., 2005).

Data was collected from Worldscope fundamentals, AspectHuntley's DatAnalysis and FinAnalysis, and Bureau van Dijk's Osiris database. The firms' age of incorporation and other governance characteristics were collected from AspectHuntley's DatAnalysis and FinAnalysis. Financial performance and financial structure were collected from Worldscope fundamentals through Datastream. Supplemental variables were obtained from the Osiris database.

3.2 OPERATIONALIZATION OF CONSTRUCTS

This section provides the operationalization of the important constructs related to the propositions developed in Chapter 2. Specifically, this section discusses how family-

[4] One year prior and one year after the sample period for the cash flows, in addition of two years prior total asset figures for asset averaging.

owned firms, value-relevance, accounting information quality, and unidentifiable intangible assets are operationalized.

3.2.1 FAMILY-OWNED FIRM

This thesis primarily uses Villalonga and Amit's (2006) family-owned firm definition, in which a firm is said to be a family-owned firm when the founding family is a shareholder and has at least one officer or director currently in the firm. The choice of this definition was based on the seminal status of this work. It is important to note that family-owned firms can be defined in a variety of ways and there is still no single commonly accepted definition (Chua et al., 1999; Hasso & Duncan, 2012). The definition used in this thesis follows the components approach of classifying family-owned firms, where family-owned firms are identified based on the components of ownership, management, and control (Chrisman et al., 2005). An alternative way of classifying family-owned firms would be to use an essence-based approach where family-owned firms are identified based on their intention to be, and remain, a family-owned firm. However, the essence based approach is generally not used in family-owned firm capital markets research as the data collection is archival and often does not include any information about the intentions of the firm (Mroczkowski & Tanewski, 2007).

Furthermore, alternative definitions of family-owned firms are used to test if the results are sensitive to the family-owned firm definition. The alternative definitions are based on the work of Anderson and Reeb (2003), Villalonga and Amit (2006), and Mroczkowski and Tanewski (2007). The definitions used in this research design are reported in *Table 3-1*. The first definition is used in the primary analysis and the remaining definitions are utilized in the sensitivity analysis only.

Table 3-1 Definitions of family-owned firm

Definition	Number of family-owned firms	Percent of sample
1. One or more family members are shareholders, and one or more family members are officers or directors (primary definition)	104	18.25%
2. One or more family members are shareholders, and one or more family members are officers or directors (dummy variable)	104	18.25%
3. One or more family members are shareholders and the chief executive officer or chief financial officer is a family member	75	13.16%
4. The family has at least 20% of the votes, and the chief executive officer or chief financial officer is a family member	51	8.95%

To identify family ownership and thus family-owned firms, this thesis follows the procedures of Mroczkowski and Tanewski (2007) who provide an approach for delineating publicly listed family and non-family-owned firms, specifically within the Australian context. Furthermore, the work of Yupitun (2008) is used to identify the founding family of firms listed on the ASX.

The first step in the process was collecting the annual reports for all the firms in the sample. The second step attempted to identify the founding family of each firm in the sample. Firm histories that were available through the annual reports, firm website or by a third party, were examined to find information in regards to the founder and his or her family. This process was facilitated by cross-referencing founding family data provided by Yupitun (2008). Third, the list of the top 20 shareholders in the notes is analyzed to identify if the founder is still a shareholder. Furthermore, any other shareholders who share the family name of the founder are examined to assess the family relationship to the founder. To include shareholdings by family members who do

not share the family name, all individuals listed in the top 20 shareholder section were examined to find potential family relationships to the founding family. Naturally, while these efforts attempt to identify all founding family shareholders, some of the individuals who did not share the founding family name may have been excluded when determining the percentage of founding family ownership. Next, the board of directors and management team were cross-referenced with the family shareholders to identify any family members that held positions as officers or directors. In addition to cross-referencing the family shareholders, any officer or director who shared the founding family name was examined further to assess a potential relationship to the founding family. Throughout this process, the disclosure of related parties in the notes of the accounts assisted in identifying relationships between shareholders, directors and management. In total, 104 firms were identified as family-owned firms. They represent 18.25% of the final sample. This number is comparable to the work of Mroczkowski and Tanewski (2007), Setia-Atmaja et al. (2011), and Yupitun (2008). The representation of family-owned firms is slightly higher in this study; this could potentially be explained by the fact that the data requirements were quite demanding, and thus stable, and large firms were more likely to be included in the sample as they tend to survive over the longer term (Francis et al., 2005).

3.2.2 VALUE-RELEVANCE

The concept of value-relevance is operationalized based on the valuation framework developed by Ohlson (1995). According to this framework, firm value is assumed to be a function of its earnings and book value. The basic value-relevance model can be stated as:

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \varepsilon_{j,t} \quad (6)$$

Where P is the price per share for firm j at fiscal year-end t plus 3 months, EPS is earnings per share for firm j at year t, and BVPS is book value per share for firm j at year t.

The value-relevance framework as stated in equation (6) is based on the premise that if earnings and book value are useful in determining the value of a firm, then the coefficients β_1 and β_2 will be positive and statistically significant. Additionally, researchers have also studied value-relevance of earnings and book value using the changes model, in which equation (6) is represented in a first difference state:

$$\Delta P_{j,t} = \beta_0 + \beta_1 \Delta EPS_{j,t} + \beta_2 \Delta BVPS_{j,t} + \varepsilon_{j,t} \quad (7)$$

Where ΔP is the change in price per share for firm j at fiscal year-end t plus 3 months as compared to the previous year, ΔEPS is the change in earnings per share for firm j at year t as compared to the previous year, and ΔBVPS is the change in book value per share for firm j at year t as compared to the previous year.

It should be noted that the specification according to equation (7) is not appropriate for the purposes of this study. Previous research has established that while the changes model works well for assessing the value-relevance of earnings and flow measures, it is not appropriate when investigating the value-relevance book value and other stock measures (Barth et al., 1998b). Seeing that changes in book value tend to have a smaller impact on firm value than change in earnings, this thesis is unable to use this model for assessing the value-relevance of book value (Hung, 2000). As the notion of unidentifiable intangible assets and their impact upon the value-relevance of book value is an integral part of this study's theoretical framework the levels model as specified in equation (6) is chosen for hypotheses testing. Exact specification of the model for the purposes of hypotheses testing will be discussed later in this chapter.

3.2.3 ACCOUNTING INFORMATION QUALITY

This thesis uses accrual quality to operationalize the construct of accounting information quality. This area of research is well developed, however it is also controversial in the sense that multiple models for estimating accrual quality exist. Furthermore, researchers are not in agreement as to which model is the 'best' (Dechow et al., 2010). Historically, research has primarily employed the Jones model (1991) and various deviations of it, the most popular being the modified Jones model as modified by Dechow et al. (1995). However, recently, there has been an increased usage of the model developed by Dechow & Dichev (2002) and then modified by McNichols (2002). This model is considered to address some of the drawbacks of the Jones model. The main problem with the Jones model and its various deviations is that it uses an indirect method to measure accrual quality (Aboody et al., 2005). According to Francis et al. (2005) the Jones model considers a large portion of the accruals as abnormal as it only controls for a limited number of fundamental characteristics of the firm, thus making it a noisy measure. In contrast, the DD (2002) model is able to overcome this shortcoming as it provides a more direct measure of accounting information quality and is able to distinguish between accruals arising from fundamentals and accruals arising from earnings management (Schipper & Vincent, 2003). Additionally, recent research in the Australian context has also suggested that the DD (2002) model as modified by McNichols (2002) is the preferred model to estimate discretionary accruals (Aldamen & Duncan, 2011; Kent et al., 2010).

As this thesis is primarily concerned with discretionary accruals and not the innate accruals of firms, the DD (2002) model as modified by McNichols (2002) will be used as the primary measure of accounting information quality[5]. In this model, the total

[5] The modified Jones model is used in the sensitivity testing stage.

accruals of the firm is regressed on past, present, and future operating cash flows; as well as the change in revenue and the level of PPE.

$$\Delta WC_{j,t} = \beta_0 + \beta_1 CFO_{j,t-1} + \beta_2 CFO_{j,t} + \beta_3 CFO_{j,t+1} + \beta_4 \Delta REV_{j,t} + \beta_5 PPE_{j,t} + \varepsilon_{j,t} \quad (8)$$

where, for firm j, $\Delta WC_{j,t}$ is a comprehensive measure of change in working capital accruals, including change in accounts receivable, accounts payable, current inventory, current investments, current provisions and other current assets and liabilities in year t, $CFO_{j,t}$ is cash flow from operations in year t, $\Delta REV_{j,t}$ is the change in operating revenue between year t-1 and year t, and $PPE_{j,t}$ is property plant and equipment in year t. All variables in equation (8) are scaled by average total assets from year t-1 to t. For each year, equation (8) is estimated sector-by-sector.

Accruals quality, AQ, is derived by taking the standard deviation of the firm-year specific residual ($\varepsilon_{j,t}$) from equation (1) for the years t-4 to t. A high variation in the error term indicates that accruals map poorly into cash flows, revenues and PPE, which implies lower quality accruals. A low standard deviation, or AQ measure, signals high accruals quality.

Furthermore, the accruals quality measure, AQ, is decomposed into innate and discretionary subcomponents in accordance with prior studies (Aldamen & Duncan, 2011; Kent et al., 2010). AQ is regressed on five innate factors identified by DD (2002) and Francis et al. (2005), namely company size, standard deviation of cash flow from operations, standard deviation of sales revenue, length of operating cycle, and earnings losses as follows:

$$AQ_j = \varphi_0 + \varphi_1 SIZE_j + \varphi_2 \sigma(CFO)_j + \varphi_3 \sigma(SALES)_j + \varphi_4 OpCycle_j + \varphi_5 NegEarn_j + \varepsilon_j \quad (9)$$

where for firm j, AQ is the accruals quality measure, $SIZE_j$ is the log of average total assets for 2002 to 2006, $\sigma(CFO)_j$ is the standard deviation of cash flow from

operation (scaled by average total assets) over the past five years, and $\sigma(SALES)_j$ is the standard deviation of sales (operating revenue, scaled by average total assets) over the past five years. OpCycle is the average age of inventory plus the average age of receivables (in days) between 2002 and 2006 (after winsorizing at 365 days), and $NegEarn_j$ is the number of years, out of the past five, where the reported income before extraordinary items is negative. The predicted values from equation (2) are the estimated innate components of the jth firm's accruals quality, IAQ. The residual values from equation (2) are the estimated discretionary components of the jth firm's accruals quality, DAQ. This measure, DAQ, is used as a proxy variable to operationalize accounting information quality.

3.2.4 UNIDENTIFIABLE INTANGIBLE ASSETS

This thesis uses an experimental variable to operationalize the level of unidentifiable intangible assets on a firm-by-firm basis. The variable is derived using factor analysis to form a one-factor solution based on three Tobin's *q* measures, and represents the underlying unobserved unidentifiable intangible assets within each firm. This section discusses why Tobin's *q* is an appropriate measure for unidentifiable intangible assets and reviews some of the prior research that has used it for this purpose.

Due to accounting regulation, unidentifiable intangible assets are not reflected in a firm's book value, and this makes it hard to quantify them for research purposes (Lev, 2001). However as market values reflect not only the book value of a firm but also the value of the firm's intangible assets, Tobin's *q* has the ability to proxy for the level of a firm's unidentifiable intangible assets. This has been stated by both accounting (Lev, 2001) and management researchers (Teece & Pisano, 1994). Industries such as information technology, where unidentified intangible assets are common, have higher

Tobin's *q* ratios in comparison to industries where book values reflect the true nature of the asset holdings (i.e. with more tangible asset bases) (Amir & Lev, 1996). The notion that Tobin's *q* can proxy for intangible assets can be traced to the seminal work of Lindenberg and Ross (1981), who showed that industries that are R&D or advertising intensive are associated with abnormally high Tobin's *q* ratios.

While these studies are primarily based on observations of *q*, further research has actually employed Tobin's *q* as a measure of unidentified intangible assets (Sanchez et al., 2000; Villalonga, 2004). Additionally, while studies have used *q* as a summative proxy for the level of intangible assets within firms (Villalonga, 2004), other studies have attempted to derive the value of specific intangible assets by regressing *q* on variables that indicate the level of the specific assets and using the predictive values as proxy measures of the specific assets (Hall, 1992, 1993; Hall et al., 2000; Ittner & Larcker, 1998; Megna & Klock, 1993; Simon & Sullivan, 1993). These studies attempt to isolate individual assets from *q* and often use survey instruments to attain information that may indicate the existence of these assets. However, such an approach is not possible for a large sample and consequently this thesis uses Tobin's *q* as a summative measure for unidentifiable intangible assets. Consequently, the approach is similar to the method employed by Villalonga (2004).

For the purpose of this thesis, three measures of *q* are estimated; Tobin's *q*, Industry-adjusted *q* and Hedonic *q*. These three measures are widely employed in research and attempt to capture the same underlying phenomena (Anderson & Reeb, 2003; Villalonga, 2004; Villalonga & Amit, 2006). Tobin's *q* is the original measure that was developed by James Tobin (Tobin, 1969) and is the sum of the market value of a firm's equity and the book value of total liabilities divided by total assets, and is estimated by the following equation:

$$\ln(Q)_{j,t} = \left(MV_{j,t} + TL_{jt}\right) / \, TA_{jt} \quad (10)$$

where MV is the market value of equity for firm j in time t, TL is the book value of debt for firm j in time t, and TA is the total assets for firm j in time t. However, it is not possible to compare the *q* value of firms in different industries as there is an industry effect on *q*. Researchers have used an industry-adjusted *q* to address this drawback and control for the industry effect of *q* (Villalonga, 2004; Villalonga & Amit, 2006). Industry-adjusted Tobin's *q* is estimated as a firm's *q* minus the median *q* in the firm's sector in the observation year.

Furthermore, while researchers have been in agreement that Tobin's *q* is able to capture the unidentifiable intangible assets of a firm to an extent, the measure in itself may be noisy as market speculation introduces volatility to the measure that is not based on the change in unidentifiable intangible assets of a firm. This issue was addressed by Villalonga (2004) who used a hedonic regression to isolate the variation in Tobin's *q* to the underlying identified intangible assets within each firm. Using this method, a Hedonic *q* is estimated by using the predictive value Tobin's *q* from a regression on intangible asset measurements that are recognized in the financial statements. The hedonic *q* is estimated as follows:

$$\ln(Q)_{j,t} = \beta_0 + \beta_1 GOODWILL_{j,t} + \beta_2 OTHERINTANG_{j,t} + \varepsilon_{j,t} \quad (11)$$

where *q* is Tobin's *q*, GOODWILL is goodwill stock divided by assets and OTHERINTANG is other intangible stock divided by assets. This model is estimated on a year-by-year and sector-by-sector basis for all sectors in the sample, as indicated by subscript j. The sector-specific estimation allows the importance of the two variables to vary across industries. The predictive values of *q* antilog are then used as the value for Hedonic *q*.

However, while all of these measures (Tobin's *q*, Industry- adjusted *q* and Hedonic *q)* have been employed in previous research as proxies for unidentifiable intangible assets (Hasso & Duncan, 2012), the existence of three highly correlated variables allows for the use of factor analysis to reduce these three measures into one summative measure that captures the underlying phenomena. Using a one factor solution, the variation in Tobin's *q*, Industry- adjusted *q* and Hedonic *q* is captured and thus forms the variable Factored *q*, which is used as the primary measure of unidentifiable intangible assets in this thesis.

3.3 OPERATIONALIZATION OF PROPOSITIONS

This section provides the operationalization of the propositions that were developed in Chapter 2. In total, 8 hypotheses are presented and these are based on the 8 propositions that were developed in Chapter 2. However, the order of these hypotheses has changed to enable easier analysis and interpretation of results. An overview of the hypotheses and the propositions that they are based on is presented in *Table 3-2.*

Table 3-2 Propositions to hypotheses

#	Proposition	#	Hypothesis
P8	There is a relationship between family ownership and unidentifiable intangible assets.	H1	There is a relationship between family ownership and unidentifiable intangible assets.
P7	There is a relationship between family ownership and accounting information quality.	H2	There is a relationship between family ownership and accounting information quality.
P1	There is a positive relationship between earnings and firm value.	H3	There is a positive relationship between earnings and firm value.
P2	There is a positive relationship between book value and firm value.	H4	There is a positive relationship between book value and firm value.
P3	The relationship between earnings and firm value is positively moderated by accounting information quality.	H5	The relationship between earnings and firm value is positively moderated by accounting information quality.
P4	The relationship between book value and firm value is moderated by accounting information quality.	H6	The relationship between book value and firm value is moderated by accounting information quality.
P6	The relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets.	H7	The relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets.
P5	The relationship between book value and firm value is moderated by the level of unidentifiable intangible assets.	H8	The relationship between book value and firm value is moderated by the level of unidentifiable intangible assets.

3.3.1 HYPOTHESIS 1: FAMILY OWNERSHIP AND ACCOUNTING INFORMATION QUALITY

To test hypothesis 1, the relationship between family ownership and accounting information quality is estimated through an OLS regression. As prior research has established specific governance mechanisms that are associated with discretionary accruals in Australia, the analysis starts by testing these associations and thus comparing the results to validate this thesis' sample. Kent et al. (2010) found that, in Australia, discretionary accruals are associated with audit quality characteristics. Specifically, the number of individuals on the audit committee and the usage of a Big 4 firm for the firm audit. Thus, following Kent et al. (2010), the following equation is estimated as a control model:

$$DAQ_j = \beta_0 + \beta_1 AUDCOM + \beta_2 BIG4_j + \varepsilon_j \quad (12)$$

where, for firm j, DAQ is the discretionary accruals quality measure derived from the residuals in equation 2, AUDCOM is the number of directors on the audit committee in 2006 and BIG4 is a dummy variable coded as 1 if the firm use a Big 4 firm for their audit in 2006. As DAQ is an inverse measure of discretionary accruals quality, both $\beta_1$and β_2 are expected to be negative. This equation is extended by introducing the FAMILY variable to test for hypothesis 1, which states that there is a relationship between family ownership and discretionary accruals quality. Additionally, to control for non-family block holders, the variable BLOCK is added to this equation as well:

$$DAQ_j = \beta_0 + \beta_1 AUDCOM + \beta_2 BIG4_j + \beta_3 FAMILY_j + \beta_4 BLOCK_j + \varepsilon_j \quad (13)$$

where, for firm j, DAQ is the discretionary accruals quality measure derived from the residuals in equation 2, AUDCOM is the number of directors on the audit committee in 2006 and BIG4 is a dummy variable coded 1 if the firm use a Big 4 firm for their firm audit in 2006, FAMILY is a continuous variable that accounts for the percentage of family ownership of the firm's shares. BLOCK is a continuous variable that accounts

for the percentage of the firm's shares held by block holders (excluding family ownership). Block holders are considered to be any non-family shareholders that own at least 5 % of the firm's shares. As hypothesis 1 is non-directional, the sign of β_3 is not predicted.

3.3.2 HYPOTHESIS 2: FAMILY OWNERSHIP AND UNIDENTIFIABLE INTANGIBLE ASSETS

To test hypothesis 2, the relationship between family ownership and unidentifiable intangible assets is examined using an OLS regression. Similar to the process for testing hypothesis 1, this process starts by establishing a control model by drawing on the work of Villalonga (2004) and Villalonga and Amit (2006). This prior research highlighted that a firm's Tobin's *q* is partially explained by factors such as firm size, age, the growth of the firm, beta, and leverage. Additionally, industry and time are also considered as hypothesis 2 uses a pooled cross-sectional sample. The control model is represented in the following equation:

$$FQ_{j,t} = \beta_0 + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \varepsilon_{j,t} \quad (14)$$

where FQ is the Factored q for firm j at year t, FIRMCONTROLS is a vector of firm control variables for firm j at year t, INDUSTRY is a vector of industry control variables for firm j at year t, YEAR is a vector of year control variables for firm j at year t.

FIRMCONTROLS is a vector of firm control variables where SIZE is the natural logarithm of the average total assets for the year; AGE is the natural logarithm of the number of years since incorporation; GROWTH is the sales growth in the past year; BETA is a proxy for market risk and is based on weekly share prices; LEVERAGE is total debt divided by the market value of equity at the end of the financial year.

INDUSTRY is a vector of industry control variables where CONDISC is a dummy variable that is coded 1 for firms in the Consumer Discretionary sector and 0 otherwise. CONSTAPLES is a dummy variable that is coded 1 for firms in the Consumer Staples sector and 0 otherwise. ENERGY is a dummy variable that is coded 1 for firms in the Energy sector and 0 otherwise. HEALTHCARE is a dummy variable that is coded 1 for firms in the Health Care sector and 0 otherwise. INDUSTRIAL is a dummy variable that is coded 1 for firms in the Industrials sector and 0 otherwise. IT is a dummy variable that is coded 1 for firms in the Information Technology sector and 0 otherwise. MATERIALS is a dummy variable that is coded 1 for firms in the Materials sector and 0 otherwise. TELECOM is a dummy variable that is coded 1 for firms in the Telecommunication Services sector and 0 otherwise.

YEAR is a vector of year control variables where 2003 is a dummy variable that is coded 1 if the firm data is from the 2003 financial year. 2004 is a dummy variable that is coded 1 if the firm data is from the 2004 financial year. 2005 is a dummy variable that is coded 1 if the firm data is from the 2005 financial year. 2006 is a dummy variable that is coded 1 if the firm data is from the 2006 financial year.

Extending upon the control model, hypothesis two is tested by introducing the variable FAMILY and the additional control-variable BLOCK:

$$FQ_{j,t} = \beta_0 + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \beta_1 FAMILY_{j,t} + \beta_2 BLOCK_{j,t} + \varepsilon_{j,t} \quad (15)$$

where FQ is the Factored q for firm j at year t, FIRMCONTROLS is a vector of firm control variables for firm j at year t, INDUSTRY is a vector of industry control variables for firm j at year t, YEAR is a vector of year control variables for firm j at year t, FAMILY is a continuous variable that accounts for the percentage of family ownership of the firm's shares. BLOCK is a continuous variable that accounts for the

percentage of the firm's shares that is held by block holders (excluding family ownership). As hypothesis 2 is non-directional, the sign of β_1 is not predicted.

3.3.3 HYPOTHESES 3-8: THE MODERATING ROLES OF ACCOUNTING INFORMATION QUALITY AND UNIDENTIFIABLE INTANGIBLE ASSETS

Hypotheses 3 to 8 relate to accounting information quality and unidentifiable intangible assets, and their moderating impact upon the value-relevance of earnings and book value. These are tested using a value-relevance methodology. As discussed earlier in this chapter, as stock measures such as book value and unidentifiable intangible assets are central to this thesis, the levels model is used as it is better suited when investigating the value-relevance of book value (Barth et al., 1998b).

While the original value-relevance framework specifies that firm value is a function of its earnings and book value, a number of studies have examined additional important firm-specific factors that also explain the variance in value. Collins et al. (1997) provide an overview of the research and identify firm-specific factors that should be controlled for in value-relevance studies, these are: (1) negative earnings; (2) size; (3) growth opportunities; and (4) leverage.

Negative earnings is an important control as the traditional value-relevance model does not consider the fact that even a firm with negative earnings will be of some value and most likely investors will place more weight upon these firms' book value (Collins et al., 1999). Additionally, firm size is of importance, as the traditional value-relevance model does not consider that smaller firms are often unprofitable and thus are valued upon their growth potential; in such cases the weight upon the earnings in the valuation may decrease. Consequently, firms' growth opportunities will impact the value-relevance of earnings and book value as these firms will tend to be valued at higher

earnings and book value multiples as compared to firms that are in the mature phase of their life cycle. Finally, leverage is important to consider as it proxies for the financial health of firms. Barth et al. (1998) showed that firms that are considered financially healthy are priced at higher multiples of their earnings and book value.

In addition to the discussed firm-specific control factors, this thesis also considers the impact of industry as it has been shown that value-relevance varies across industries (Lev, 2001). Finally. controls for time are introduced as the sample is a pooled sample that spans the years 2002 to 2006. The full control model used for testing the value-relevance hypotheses is specified as follows:

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \varepsilon_{j,t} \quad (16)$$

where P is the price per share for firm j at fiscal year-end t plus 3 months, EPS is earnings per share for firm j at year t, and BVPS is book value per share for firm j at year t, FIRMCONTROLS is a vector of firm control variables for firm j at time t, INDUSTRY is a vector of industry control variables for firm j at year t, YEAR is a vector of year control variables for firm j at year t.

FIRMCONTROLS is a vector of firm control variables where LOSS is a dummy variable that is coded as 0 if the EPS is a negative number, SMALL is a dummy variable that is coded as 0 for firms whose total assets are below the sample median in year t, GROWTH is the sales growth between year t-1 and year t, LEVERAGE is total liabilities to total assets ratio in year t. The vector also includes interaction effects between each firm control variable and the variables EPS and BVPS.

INDUSTRY is a vector of industry control variables where CONDISC is a dummy variable that is coded 1 for firms in the Consumer Discretionary sector and 0 otherwise. CONSTAPLES is a dummy variable that is coded 1 for firms in the

Consumer Staples sector and 0 otherwise. ENERGY is a dummy variable that is coded 1 for firms in the Energy sector and 0 otherwise. HEALTHCARE is a dummy variable that is coded 1 for firms in the Health Care sector and 0 otherwise. INDUSTRIAL is a dummy variable that is coded 1 for firms in the Industrials sector and 0 otherwise. IT is a dummy variable that is coded 1 for firms in the Information Technology sector and 0 otherwise. MATERIALS is a dummy variable that is coded 1 for firms in the Materials sector and 0 otherwise. TELECOM is a dummy variable that is coded 1 for firms in the Telecommunication Services sector and 0 otherwise. The vector also includes interaction effects between each industry control variable and the variables EPS and BVPS.

YEAR is a vector of year control variables where 2003 is a dummy variable that is coded 1 if the firm data is from the 2003 financial year. 2004 is a dummy variable that is coded 1 if the firm data is from the 2004 financial year. 2005 is a dummy variable that is coded 1 if the firm data is from the 2005 financial year. 2006 is a dummy variable that is coded 1 if the firm data is from the 2006 financial year. The vector also includes interaction effects between each year control variable and the variables EPS and BVPS.

Having established the control model, this thesis proceeds to specify the models used to test each value-relevance hypothesis. Hypotheses 5 and 6 relate to the moderating effect of accounting information quality on the value-relevance of earnings and book value. Model 17 introduces the proxy variable for accounting information quality, DAQ, and the interaction effects between DAQ and EPS, and DAQ and BVPS. The equation is as follows:

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \beta_3 DAQ_{j,t} + \beta_4 EPS_{j,t} * DAQ_{j,t} + \beta_5 BVPS_{j,t} * DAQ_{j,t} + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \varepsilon_{j,t} \quad (17)$$

Hypotheses 7 and 8 relate to the moderating effect of unidentifiable intangible assets on the value-relevance of earnings and book value. As previously discussed in this chapter, unidentifiable intangible assets are operationalized by using the variable FQ, Factored *q*. However, as both FQ and the dependent variable in value-relevance models, price, are derivatives of market value this introduces simultaneous equation bias.

Consequently, this thesis proceeds to remove the effect of simultaneous equation bias by using a 2-stage least squares method as used by Barth et al. (1998). In the first stage, FQ is regressed on all the control variables in equations (14) and (16). The predicted value of FQ from this regression is used as the new proxy for unidentifiable intangible assets. In the second stage, the value-relevance of unidentifiable intangible assets is tested by introducing the predicted value of FQ to model 16. By construction, the predicted value does not reflect the association between the estimation error in FQ and price per share. The equation to test hypotheses 7 and 8 is as follows:

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \beta_3 FQ_{j,t} + \beta_4 EPS_{j,t} * FQ_{j,t} + \beta_5 BVPS_{j,t} * FQ_{j,t} + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \varepsilon_{j,t} \quad (18)$$

where FQ is the level of unidentifiable intangible assets for firm j at time t and is the predictive value of FQ derived from a regression of FQ on all the control variables in equations (14) and (16).

Finally, this thesis finishes the testing of hypotheses 3 to 8 by introducing a full model that tests these hypotheses jointly.

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \beta_3 DAQ_{j,t} + \beta_4 EPS_{j,t} * DAQ_{j,t} + \beta_5 BVPS_{j,t} * DAQ_{j,t} + \beta_6 FQ_{j,t} + \beta_7 EPS_{j,t} * FQ_{j,t} + \beta_8 BVPS_{j,t} * FQ_{j,t} + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \varepsilon_{j,t} \quad (19)$$

While the full model is theoretically convincing as it captures all the proposed relationships, it comes at the expense of simplicity as the full model includes a number

of two-way interactions that are difficult to interpret from a reader's perspective. The table below presents a detailed explanation of the purpose of each coefficient in model 19 and relates it to the hypothesis that each coefficient tests.

Table 3-3 Purpose of each coefficient in model 19

Coefficient	**Purpose**
β_0	No hypothesis, β_0 is the constant in the model.
$\beta_1 EPS_{j,t}$	Tests H3, that there is a positive relationship between earnings and firm value. If β_1 is significant and positive then H3 is supported.
$\beta_2 BVPS_{j,t}$	Tests H4, that there is a positive relationship between book value and firm value. If β_2 is significant and positive then H4 is supported.
$\beta_3 DAQ_{j,t}$	Does not test any hypothesis however is required for statistical validity in order to test H5 and H6. This coefficient estimates the main effect of accounting information quality.
$\beta_4 EPS_{j,t} * DAQ_{j,t}$	Tests H5, that the relationship between earnings and firm value is positively moderated by accounting information quality. If β_4 is significant and negative (DAQ is an inverse measure) then H5 is supported.
$\beta_5 BVPS_{j,t} * DAQ_{j,t}$	Tests H6, that the relationship between book value and firm value is moderated by accounting information quality. If β_5 is significant then H6 is supported
$\beta_6 FQ_{j,t}$	Does not test any hypothesis however is required for statistical validity in order to test H7 and H8. This coefficient estimates the main effect of unidentifiable intangible assets.
$\beta_7 EPS_{j,t} * FQ_{j,t}$	Tests H7, that the relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets. If β_7 is significant and then H7 is supported.
$\beta_8 BVPS_{j,t} * FQ_{j,t}$	Tests H8, that the relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets. If β_8 is significant and then H8 is supported.
$\gamma FIRMCONTROLS_{j,t}$	No hypothesis, γ is a vector of firm control variables for firm j at time t
$\delta INDUSTRY_{j,t}$	No hypothesis, δ is a vector of industry control variables for firm j at year t
$\theta YEAR_{j,t}$	No hypothesis, θ is a vector of year control variables for firm j at year t

In addition to model 19, two additional models are estimated to investigate the family effect in further detail. First, a model is estimated that is consistent with prior research that explores the relationship between ownership and value-relevance of accounting information (Bae & Jeong, 2007; Cascino et al., 2010). This model ignores the concepts of accounting information quality and unidentifiable intangible assets and instead assumes that any ownership effect would have a direct effect on the value-relevance of earnings and book value. This model is specified as follows:

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \beta_3 FAMILY_{j,t} + \beta_4 EPS_{j,t} * FAMILY_{j,t} + \beta_5 BVPS_{j,t} * FAMILY_{j,t} + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \zeta BLOCK_{j,t} + \varepsilon_{j,t} \quad (20)$$

Furthermore, an additional model is estimated that combines models 19 and 20, and thus explores if there is a residual family effect. This model incorporates the moderating effects of accounting information quality and unidentifiable intangible assets. Family ownership is also included to estimate any residual effects that it may have in excess of any effect that is captured through accounting information quality and unidentifiable intangible assets.

$$P_{j,t} = \beta_0 + \beta_1 EPS_{j,t} + \beta_2 BVPS_{j,t} + \beta_3 DAQ_{j,t} + \beta_4 EPS_{j,t} * DAQ_{j,t} + \beta_5 BVPS_{j,t} * DAQ_{j,t} + \beta_6 FQ_{j,t} + \beta_7 EPS_{j,t} * FQ_{j,t} + \beta_8 BVPS_{j,t} * FQ_{j,t} + \beta_9 FAMILY_{j,t} + \beta_{10} EPS_{j,t} * FAMILY_{j,t} + \beta_{11} BVPS_{j,t} * FAMILY_{j,t} + \gamma FIRMCONTROLS_{j,t} + \delta INDUSTRY_{j,t} + \theta YEAR_{j,t} + \zeta BLOCK_{j,t} + \varepsilon_{j,t} \quad (21)$$

If β_{10} is significant then family-ownership itself moderates the value-relevance of earnings, in excess of the family effect through the pathways of accounting information quality and unidentifiable intangible assets. Furthermore, if β_{11} is significant then family-ownership itself moderates the value-relevance of book value in excess of the family effect through the pathways of accounting information quality and unidentifiable intangible assets. This model is important in finding any unexplained effects and may provide avenues for future research.

3.4 SUMMARY OF HYPOTHESES

In total, 8 hypotheses have been presented in this chapter. Additionally, the models used to test each hypothesis have been introduced. The table below summarises the hypotheses and the decision rules that will be used in the hypotheses testing.

Table 3-4 Summary of hypotheses

#	Hypothesis	Decision rule
H1	There is a relationship between family ownership and accounting information quality.	$\beta_3 \neq 0$ (Model 13)
H2	There is a relationship between family ownership and unidentifiable intangible assets.	$\beta_1 \neq 0$ (Model 15)
H3	There is a positive relationship between earnings and firm value.	$\beta_1 > 0$ (Model 19)
H4	There is a positive relationship between book value and firm value.	$\beta_2 > 0$ (Model 19)
H5	The relationship between earnings and firm value is positively moderated by accounting information quality.	$\beta_4 < 0$ (Model 19)
H6	The relationship between book value and firm value is moderated by accounting information quality.	$\beta_5 \neq 0$ (Model 19)
H7	The relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets.	$\beta_7 \neq 0$ (Model 19)
H8	The relationship between book value and firm value is moderated by the level of unidentifiable intangible assets.	$\beta_8 \neq 0$ (Model 19)

3.5 SUMMARY OF VARIABLES

This thesis uses a large number of variables. To improve understandability, all variables across the models are summarised in the table below with a description of each variable.

Table 3-5 Summary of variables

Group	Variable	Description
Family Definition	*FAMILY (primary definition)*	A firm is said to be a family-owned firm when one or more family members are shareholders, and one or more family members are officers or directors (continuous variable)
	FAMILY (alt. 1)	A firm is said to be a family-owned firm when one or more family members are shareholders, and one or more family members are officers or directors (dummy variable)
	FAMILY (alt. 2)	A firm is said to be a family-owned firm when one or more family members are shareholders and the chief executive officer or chief financial officer is a family member (continuous variable)
	FAMILY (alt. 3)	A firm is said to be a family-owned firm when the family has at least 20% of the votes, and the chief executive officer or chief financial officer is a family member (continuous variable)
Accounting Information Quality	*Accruals quality (AQ)*	The DD (2002) model as modified by McNichols (2002) is used to measure accruals quality. In this model, the total accruals of the firm is regressed on past, present, and future operating cash flows; as well as on the change in revenue and the level of PPE. Accruals quality, *AQ*, is derived by taking the standard deviation of the firm-year specific residual ($\varepsilon_{j,t}$) from equitation (1) for the years *t-4* to *t*.
	Discretionary accruals quality (DAQ)	*AQ* is regressed on five innate factors identified by Dechow and Dichev (2002) and Francis et al. (2005), namely company size, standard deviation of cash flow from operations, standard deviation of sales revenue, length of operating cycle, and earnings losses. The residual values from the regression are the estimated discretionary components of the *j*th firm's accruals quality.
	AUDCOM	*AUDCOM* is the number of directors on the audit committee in 2006
	BIG4	*BIG4* is a dummy variable coded as 1 if the firm uses a Big 4 firm for their firm audit in 2006
	SIZE (Model 13)	*Size* is the natural log of average total assets between 2002 and 2006
	σ(CFO)	*σ(CFO)* is standard deviation of *CFO* scaled by total assets over the past five years
	σ(Sales)	*σ(Sales)* is the standard deviation of sales scaled by total assets between 2002 and 2006

Group	Variable	Description
	OpCycle	*OpCycle* is the average age of inventory plus the average age of receivables (in days) between 2002 and 2006
	NegEarn	*NegEarn* is the of number of years in which a loss was reported for between 2002 and 2006.
	CFO	CFO is the cash flow from operations.
	WC	WC is a comprehensive measure of working capital accruals, including change in accounts receivable, accounts payable, current inventory, current investments, current provisions and other current assets and liabilities
	PPE	PPE is the property plant and equipment
Unidentifiable Intangible Assets	*Tobin's q (TQ)*	Tobin's *q* is the ratio between the firm's market value to the replacement cost of its physical assets. It is approximated by dividing the sum of the market value of equity and total liabilities by total assets.
	Industry- adjusted q (IQ)	Difference between the firm's Tobin's *q* and the asset-weighted average of the imputed *q*'s of its sector, where a sector's imputed *q* is the sector average *q*.
	Hedonic q (HQ)	This measure of resource intangibility is the predicted value obtained from the regression of Tobin's *q* on two accounting measures of intangible assets: goodwill and intangibles excluding goodwill.
	Factored q (FQ)	This experimental variable is a one factor solution of Tobin's *q,* Industry- adjusted *q* and Hedonic *q*.
	GOODWILL	Goodwill stock divided by assets.
	OTHERINTANG	Other intangible stock divided by asset.
	SIZE (Model 15)	Natural logarithm of the average total assets for the year
	AGE	Natural logarithm of the number of years since incorporation
	GROWTH	Sales growth in the past year
	BETA	Proxy for market risk and is based on weekly share prices

Group	Variable	Description
	LEVERAGE	Total debt divided by the market value of equity at the end of the financial year.
Value-Relevance	*P*	Price per share for firm j at fiscal year-end t plus 3 months
	EPS	Earnings per share for firm j at year t
	BVPS	Book value per share for firm j at year t
	LOSS	Dummy variable that is coded as 0 if the EPS is a negative number,
	SMALL	Dummy variable that is coded as 0 for firms whose total assets are below the sample median in year t
	GROWTH (Model 19)	Sales growth between year t-1 and year t,
	LEVERAGE (Model 19)	Total liabilities to total assets ratio in year t.
	EBIT	EBIT is earnings before interest and tax
	MV	MV is market value
	AGE	Age is the number of years since incorporation

3.6 SUMMARY OF RESEARCH DESIGN

This chapter presented the research design for this thesis. The sample for the hypotheses testing is comprised of 570 public firms that were listed on the ASX between 2002 and 2006. The low sample size is driven by the data requirements for hypotheses testing, as eight years of continuous data is necessary. Of these firms, 104 were identified as family-owned firms using the family-owned firm definition developed by Villalonga and Amit (2006). Alternative family-owned firm definitions were identified from prior literature and will be used in sensitivity testing.

The construct of accounting information quality was operationalized using an accrual quality model. The review of existing literature identified the Dechow and Dichev (2002) model as modified by McNichols (2002) to be the most appropriate in estimating discretionary accruals and will be used as the primary measure for accounting information quality. The modified Jones model will also be used in sensitivity testing.

The construct of unidentifiable intangible assets was operationalized by developing a factored experimental variable, Factored *q*. Prior literature identified Tobin's *q* to be an appropriate proxy for intangible assets that are not recognized in the book value of a firm. The literature also used several different estimates of *q*, including the original Tobin's *q*, industry-adjusted *q*, and hedonic *q*. As these estimates attempt to measure the same underlying phenomena, a one-factor solution was formed to capture the variation among these three estimations.

Using these operationalizations, the propositions developed in Chapter 2 were transformed to hypotheses, and OLS regression models were specified in accordance with the prior literature to enable testing of the hypotheses. These hypotheses will now be formally tested in Chapter 4.

Chapter 4: Results

This chapter presents the empirical tests of the hypotheses developed in this thesis. The empirical tests presented derive from the research design discussed in chapter 3. First, the descriptive statistics for this sample are presented, together with separate descriptive statistics for each model that is used for hypotheses testing. Following, the models used in hypotheses testing are estimated and their results reported. The initial findings are presented and are then subjected to robustness testing, investigating the statistical robustness of the results as well as the robustness of the construct operationalization. The final section summarizes the findings of the results.

4.1 DESCRIPTIVE STATISTICS

Table 4-1 shows the sector-by-sector representation in the sample. The table also contains information about the presence of family-owned firms in each sector. The largest sector in the sample is the Materials sector (24.7%), followed by Industrials (18.6%) and Consumer Discretionary (17.5%). However, while the Consumer Discretionary sector is only the third largest sector in the sample, 35% of the firms in this sector are classified as family-owned firms. In comparison, family-owned firms represent 16.32% of the firms in the sample as a whole. In addition to the Consumer Discretionary sector, family-owned firms are also heavily represented in the Telecommunication Services sector, where they comprise 21.43% of firms. The disproportionate representation of family-owned firms in certain sectors indicates a need to control for sector in hypotheses testing.

Table 4-1 Sector representation

GICS Sector	Number of firms	Percent of sample	Family-owned firms	Non-Family-owned firms	Percent family-owned firms
Consumer Discretionary	100	17.5	35	65	35.00%
Consumer Staples	30	5.3	3	27	10.00%
Energy	47	8.2	3	44	6.38%
Health Care	57	10.0	10	47	17.54%
Industrials	106	18.6	16	90	15.09%
Information Technology	69	12.1	13	56	18.84%
Materials	141	24.7	10	131	7.09%
Telecommunication Services	14	2.5	3	11	21.43%
Utilities	6	1.1	0	6	0.00%
Total	570	100.0	93	477	16.32%

Table 4-2 shows the descriptive statistics for the variables used in the hypotheses testing later in this chapter. These are grouped according to the hypotheses they test.

The variable used to measure accounting information quality, DAQ, has a range between -0.374 and 0.462. This variable is an inverse measure, meaning that high values in DAQ are unfavourable and imply poor accounting information quality. The number of members on the audit committee, AUDCOM, ranges from 0 to 7, with 50% of the firms having between 2 and 3 audit committee members. Non-family block holders are very prevalent in the sample, on average they represent 35.7% of shareholders in firms, and in extreme cases up to 88% of a firm's shareholders are block holders. Similarly, while family ownership averages 6% for the whole sample, the family on average holds 32.8% of the outstanding shares in firms that are classified as family-owned firms. Other notable insights from the descriptive statistics include the fact the average beta for the firms in the sample is 0.82, meaning that the firms in the sample are on average less risky than the market. This is expected, as the measurement of certain variables required several years of detailed financial data, biasing the sample towards larger and more stable firms.

Table 4-2 Descriptive statistics for continuous variables

Variable	N	Mean	Std. Dev.	Percentiles				
				Min	25th	Median	75th	Max
H1 – Accounting Information Quality								
DAQ	570	-0.002	0.114	-0.374	-0.067	-0.017	0.041	0.462
AUDCOM	570	2.439	1.505	0.000	2.000	3.000	3.000	7.000
BLOCK	570	0.357	0.195	0.000	0.200	0.370	0.500	0.880
FAMILY	570	0.060	0.152	0.000	0.000	0.000	0.000	0.860
H2 – Unidentifiable Intangible Assets								
FQ	2850	0.013	0.621	-0.684	-0.264	-0.098	0.030	3.816
FAMILY	2850	0.060	0.152	0.000	0.000	0.000	0.000	0.860
GROWTH	2850	0.987	4.343	-0.970	-0.100	0.090	0.400	33.265
AGE (log of Age)	2850	2.544	0.640	1.390	1.950	2.560	3.000	4.010
LEVERAGE	2850	0.811	1.251	0.000	0.130	0.390	0.880	7.690
BLOCK	2850	0.357	0.195	0.000	0.200	0.370	0.500	0.880
BETA	2850	0.820	0.366	-0.090	0.590	0.800	1.010	2.130
SIZE (log of TA)	2850	17.812	2.239	13.525	16.190	17.450	19.213	23.486
H3-H8 – Value-Relevance								
PRICE	2850	2.187	4.394	0.010	0.100	0.440	2.390	29.204

Variable	N	Mean	Std. Dev.	Percentiles				
				Min	25th	Median	75th	Max
EPS	2850	8.890	26.266	-56.753	-1.900	0.600	13.800	134.867
BVPS	2850	1.014	1.749	0.000	0.050	0.240	1.150	9.646
DAQ	2850	-0.002	0.112	-0.270	-0.067	-0.017	0.040	0.384
FQ (Predicted)	2850	0.013	0.369	-1.006	-0.233	-0.023	0.210	2.005
FAMILY	2850	0.060	0.152	0.000	0.000	0.000	0.000	0.860
BLOCK	2850	0.357	0.195	0.000	0.200	0.370	0.500	0.880
GROWTH	2850	0.987	4.343	-0.970	-0.100	0.090	0.400	33.265
LEVERAGE	2850	0.440	0.315	0.017	0.222	0.425	0.586	2.029

This thesis reports a descriptive overview of the dummy variables used in the hypotheses testing. The frequencies for these variables are presented in *Table 4-3*. We can observe that the majority of the firms (62.5%) use a Big 4 auditor. Additionally, in 44.9% of cases, the dummy variable Loss has a value of 1, meaning that these firms have negative earnings per share for that year. This pattern highlights the necessity to include this variable in the testing of hypotheses 3 to 8, as a large number of these firms must be valued based on their book value and cannot be valued based on earnings.

Table 4-3 Descriptive statistics for dummy variables

Variable	Value	Frequency	Percent
BIG4			
	0	214	37.5
	1	356	62.5
	Total	570	100.0
SMALL			
	0	1425	50.0
	1	1425	50.0
	Total	2850	100.0
LOSS			
	0	1569	55.1
	1	1281	44.9
	Total	2850	100.0

Next, the correlation matrix for the variables in hypothesis 1 is explored (see *Table 4-4).* The dependent variable DAQ is significantly and negatively correlated with

the number of members on the audit committee (AC), the usage of a Big 4 auditor (BIG4), and family ownership (Family). These correlations indicate that these variables will be relevant in testing hypothesis 1. Additionally, there is a significant and positive correlation between the number of members on the audit committee (AUDCOM) and the usage of a Big 4 auditor as well as a significant and positive correlation between the AUDCOM variable and non-family block holders. Finally, there is also a significant and negative correlation between family ownership and non-family block holders. These significant correlations between the independent variables suggest that there may be concerns with multicollinearity, which is addressed in the robustness testing later in the chapter.

Table 4-4 Correlation matrix for variables in Hypothesis 1

	DAQ	**AUDCOM**	**BIG4**	**FAMILY**	**BLOCK**
DAQ	1				
ADUCOM	-.142**	1			
BIG4	-.174**	.176**	1		
FAMILY	-.120**	.003	.000	1	
BLOCK	.013	.094*	.029	-.270**	1

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels[6]
The table contains pairwise correlations based on 570 observations.

Table 4-5 presents the correlation matrix for the variables used in testing hypothesis 2. The dependent variable, FQ, is significantly and negatively correlated to the age of the firm, its size (log of total assets) and leverage (Debt/MV). A significant and positive correlation exists between the dependent variable and family ownership, providing initial support for hypothesis 2. However, there are also numerous significant correlations between the independent variables. Growth is significantly and negatively

[6] This thesis denotes significance at the 1%, 5% and 10% levels using symbols. However, it should be noted that some academic journals prefer not to denote results that are significant at the 10% level. As there is no consensus with respect to this issue, this thesis denotes results that are significant at the 10% level using the * symbol, and leaves it to the reader to decide if these results are "significant" or not.

correlated to size and leverage. Larger firms tend to grow at lower rates, and high-growing firms rely more heavily on equity funding. Interestingly, the age of the firm has a significant positive correlation to the risk of the firm, as measured by the beta, and has a significant negative correlation to family ownership. This data appears surprising because older firms are often stereotyped as less risky and family-owned firms are often suggested to be older. These correlations could be an attribute of the sample composition and its bias towards larger and more stable firms, and these relationships may be true for these firms in particular. Additionally, family ownership is significantly and positively correlated to leverage while negatively correlated with risk. In contrast, non-family block holder ownership is significantly and positively correlated to leverage, risk, and size. The numerous significant correlations between independent variables once again suggest potential problems of multicollinearity in the testing phase.

Table 4-5 Correlation matrix for variables in Hypothesis 2

	FQ	**GROWTH**	**AGE**	**SIZE**	**LEVERAGE**	**BETA**	**FAMILY**	**BLOCK**
FQ	1							
GROWTH	.026	1						
AGE	-.144**	-.026	1					
SIZE	-.220**	-.100**	.171**	1				
LEVERAGE	-.187**	-.060**	.034	.105**	1			
RISK	.007	-.008	.060**	.014	.069**	1		
FAMILY	.106**	-.036	-.077**	.003	.066**	-.071**	1	
BLOCK	-.008	.008	-.024	.109**	.108**	.102**	-.270**	1

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels
The table contains pairwise correlations based on 2850 observations.

The correlation matrix for the variables used to test hypotheses 3 to 8 is depicted in *Table 4-6*. As expected, the dependent variable, PRICE, is significantly and highly positively correlated to both EPS and BVPS. Additionally, PRICE is also significantly and negatively correlated to the dummy variables LOSS and SMALL. While price was not found to be significantly correlated to family ownership, DAQ and LOSS had significant and negative correlations to family ownership while FQ is significantly and

positively correlated to family ownership. FQ is also significantly and negatively correlated to BVPS, indicating that high intangibility and book value per share are related. There are also significant correlations between all control variables and EPS as well as between these variables and BVPS.

Table 4-6 Correlation matrix for variables in Hypothesis 3-8

	Price	**EPS**	**BVPS**	**DAQ**	**FQ**	**Family**	**Block**	**Growth**	**Leverage**	**Loss**	**Small**
Price	1										
EPS	.765**	1									
BVPS	.819**	.695**	1								
DAQ	-.011	-.009	-.063**	1							
FQ (Predicted)	.070**	-.029	-.192**	.198**	1						
FAMILY	-.017	-.005	.023	-.123**	.178**	1					
BLOCK	.009	-.006	-.019	.016	-.013	-.270**	1				
Growth	-.071**	-.064**	-.087**	.075**	.044*	-.036	.008	1			
Leverage	.080**	.038*	.062**	.069**	.212**	.014	.090**	-.099**	1		
Loss	-.342**	-.537**	-.374**	.001	.184**	-.091**	-.021	.093**	-.076**	1	
Small	-.438**	-.400**	-.442**	-.058**	-.138**	.025	-.061**	.049**	-.014	.455**	1

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels
The table contains pairwise correlations based on 570 observations.

4.2 H1: FAMILY OWNERSHIP AND ACCOUNTING INFORMATION QUALITY

A relationship (non-directional) was hypothesized between family ownership and discretionary accruals quality (hypothesis 1). Before testing this hypothesis, this thesis considers the impact of the audit committee size and the usage of a Big 4 auditor, as these two variables were shown to be the two significant drivers of discretionary accruals in Australia by Kent et al. (2010). *Table 4-7* shows the results for the regression using only these control variables; they confirm the previous results of Kent et al. (2010), as both AUDCOM (β =-.009, p<.01) and BIG4 (β =-.036, p<.01) are shown to be significant and negative. This means that a positive relationship (DAQ is an inverse measure) exists between audit committee size and discretionary accruals quality. There is also a positive relationship between use of a Big 4 auditor and discretionary accruals quality. It should be noted that Kent et al. (2010) estimated the discretionary

accruals (DAQ) using a pooled model, while these results are based on discretionary accruals estimations derived from sector by sector estimations. Consequently, these results provide incremental knowledge to the study of Kent et al. (2010).

Next, the family ownership variable is introduced to test hypothesis 1: that there is a relationship between family ownership and discretionary accruals quality. *Table 4-7* shows the results after including the FAMILY variable. The variable FAMILY (β =-.091, $p<.01$) is shown to be significant and has a negative coefficient. In other words, as the DAQ measure is inverse, family ownership has a positive association with discretionary accruals quality. Notably, there is no significant relationship between non-family block holders and discretionary accruals quality. Furthermore, there is a significant change in the R square (Δ=0.014, $p<.05$) in comparison to the control model. In conclusion, the results indicate that family ownership is positively associated with accounting information quality.

Table 4-7 Family ownership and accounting information quality

Variable	**beta (t-stat)**	**beta (t-stat)**
(Constant)	0.042***	0.048***
	(4.098)	(3.57)
AUDCOM	-0.009***	-0.009***
	(-2.757)	(-2.743)
BIG4	-0.036***	-0.036***
	(-3.693)	(-3.716)
BLOCK		-0.003
		(-0.102)
FAMILY		-0.091***
		(-2.856)
Adjusted R Square	0.040	0.051
Std. Error of the Est.	0.112	0.111
F	12.805	8.638
Sig.	0.000	0.000
n	570	570
R Square Change		0.014
Sig.		0.014

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

AUDCOM is the number of directors on the audit committee in 2006 and BIG4 is a dummy variable coded as 1 if the firm uses a Big 4 firm for their firm audit in 2006. FAMILY is a continuous variable that accounts for the percentage of family ownership of the firm's shares. BLOCK is a continuous variable that accounts for the percentage of the firm's shares that is held by block holders (excluding family ownership).

4.3 H2: FAMILY OWNERSHIP AND UNIDENTIFIABLE INTANGIBLE ASSETS

In H2, a relationship between unidentifiable intangible assets and family ownership is hypothesized. The results of the empirical test of H2 are reported in *Table 4-8*, and show that the predictors of the model explained 14.3% of the variance (Adj. R2=.143, $F(2,55)= 26.062$, $p<.01$). It was found that the variable of interest, FAMILY, significantly predicted unidentifiable intangible assets ($\beta = .479$, $p<.01$). Additionally, non-family block holders were also found to have a positive and significant association with resource intangibility ($\beta = .228$, $p<.01$). Furthermore, SIZE ($\beta =-.048$, $p<.01$), Age ($\beta =-.062$, $p<.01$), and BETA ($\beta =-.079$, $p<.01$) had significant and negative associations with unidentifiable intangible assets. While none of the yearly dummies had any significant associations, industry dummies for consumer discretionary ($\beta = .178$, $p<.1$), health care ($\beta = .548$, $p<.01$) and information technology ($\beta = .195$, $p<.1$) all had significant and positive associations with resource intangibility. The results also indicate that there is a stronger relationship for FAMILY ($\beta = .479$, $p<.01$) compared to BLOCK ($\beta = .228$, $p<.01$). It could be suggested that for each additional percentage of ownership, family ownership has twice the impact upon unidentifiable intangible assets in comparison to non-family block holder ownership. Furthermore, there is a significant change in the R square ($\Delta=0.013$, $p<.01$) in comparison to the control model. These results suggest that hypothesis 2 should not be rejected at this point.

Table 4-8 Family ownership and unidentifiable intangible assets

Variable	beta (t-stat)	beta (t-stat)
(Constant)	0.903***	0.803***
	(6.349)	(5.631)
FAMILY		0.479***
		(6.245)
BLOCK		0.228***
		(3.853)
SIZE	-0.046***	-0.048***
	(-8.906)	(-9.25)
AGE	-0.072***	-0.062***
	(-4.066)	(-3.517)
GROWTH	0.000	0.000
	(-0.009)	(-0.007)
BETA	-0.073***	-0.079***
	(-8.033)	(-8.682)
LEVERAGE	0.032	0.036
	(1.062)	(1.203)
Controls - GICS Sector	YES	YES
Controls – Year	YES	YES
Adjusted R Square	0.131	0.143
Std. Error of the Estimate	0.579	0.575
F	26.180	26.062
Sig.	0.000	0.000
n	2850	2850
R Square Change		0.013
Sig.		0.000

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

FAMILY is a continuous variable that accounts for the percentage of family ownership of the firm's shares. BLOCK is a continuous variable that accounts for the percentage of the firm's shares that is held by block holders (excluding family ownership). SIZE is the natural logarithm of the average total assets for the year. AGE is the natural logarithm of the number of years since incorporation. GROWTH is the sales growth in the past year. BETA is a proxy for market risk and is based on weekly share prices. LEVERAGE is total debt divided by the market value of equity at the end of the financial year. All continuous variables are winsorized at 1% and 99%.

4.4 H3-H8: ACCOUNTING INFORMATION QUALITY, UNIDENTIFIABLE INTANGIBLE ASSETS, FAMILY OWNERSHIP AND VALUE-RELEVANCE OF ACCOUNTING INFORMATION

Hypotheses 3 to 8 relate to the value-relevance of accounting information and the moderating effects of accounting information quality and unidentifiable intangible assets. *Table 4-9* reports the results from the primary test for hypotheses 3 to 8. First, a

control model is estimated to examine the extent to which the variance in price can be explained by the controls (model 16). The results indicate that the controls explained 82.5% of the variance (Adj. R2=.825, F(2,55) 269.129, p<.01) in price. It should be noted that this control model considers EPS and BVPS and controls for firm characteristics, GICS sector, and time effects. While EPS (β =.079, p<.01) was found to have a significant and positive association with price, BVPS did not contribute to explaining the variance in price. The non-significance of BVPS is most likely due to the inclusion of extensive controls.

Next, models 17 and 18 are estimated to examine the effects of accounting information quality and unidentifiable intangible assets separately and to be able to examine the incremental explanatory power of each construct. However, these are not used in the hypotheses testing as they do not capture the full conceptual model of this thesis. Instead, this thesis focuses on model 19, which includes the variables of interest for hypotheses 5 to 8, namely; DAQ, FQ, and various interaction effects. The variables in the full model explained 90.9% of the variance (Adj. R2=.909, F(2,55)=507.699, p<.01) in price and the findings are reported in *Table 4-9.* Notably, there is a significant change in the R square (Δ=0.083, p<.01) in comparison to the control model.

Table 4-9 Regression results for H3-H8

Variable	Model 16	Model 17	Model 18	Model 19	Model 20	Model 21
Fundamentals						
(Constant)	0.019 (0.045)	0.062 (0.149)	0.283 (0.924)	0.18 (0.595)	0.005 (0.012)	0.314 (1.038)
EPS (H3)	0.069*** (4.781)	0.066*** (4.632)	0.032*** (3.033)	0.024** (2.306)	0.077*** (4.986)	0.043*** (3.862)
BVPS (H4)	-0.036 (-0.107)	0.185 (0.545)	0.388 (1.551)	0.814*** (3.285)	-0.212 (-0.6)	0.513** (2.008)
H5-H6 - Accounting Information Quality						
DAQ		0.185 (0.528)		-0.427* (-1.65)		-0.495* (-1.925)
EPS * DAQ (H5)		0.015 (0.497)		-0.085*** (-3.717)		-0.1*** (-4.37)
BVPS * DAQ (H6)		1.994*** (3.557)		4.209*** (10.288)		3.702*** (9.13)
H7-H8 – Unidentifiable Intangible Assets						
FQ			0.653*** (5.673)	0.619*** (5.38)		0.821*** (6.924)
EPS * FQ (H7)			0.074*** (19.398)	0.073*** (19.369)		0.074*** (19.759)
BVPS * FQ (H8)			1.006*** (15.911)	1.074*** (17.247)		1.143*** (18.477)
Family Ownership						
FAMILY					0.065 (0.226)	-0.645*** (-3.009)
EPS * FAMILY					0.005 (0.311)	-0.031*** (-2.623)
BVPS * FAMILY					-0.11 (-0.509)	-0.509*** (-3.291)
Controls –Block holders	NO	NO	NO	NO	YES	YES
Controls - Firm Characteristics	YES	YES	YES	YES	YES	YES
Controls - GICS Sector	YES	YES	YES	YES	YES	YES
Controls – Year	YES	YES	YES	YES	YES	YES
Adjusted R Square	0.825	0.827	0.905	0.909	0.825	0.913
Std. Error of the Est.	1.840	1.830	1.357	1.327	1.839	1.297
F	269.129	257.231	511.023	507.699	240.494	482.710
Sig.	0.000	0.000	0.000	0.000	0.000	0.000
n	2850	2850	2850	2850	2850	2850
R Square Change		0.002	0.079	0.083	0.000	0.087
Sig.		0.000	0.000	0.000	0.331	0.000

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

P is share price three months after a firm's fiscal year end. BVPS is book value of equity per share. EPS is net income per share. DAQ is the discretionary accruals quality measure as estimated using the DD (2002) model as modified by McNichols (2002). FQ is the predicted factored q score. All continuous variables are winsorized at 1% and 99%. FAMILY is a continuous variable that accounts for the percentage of family ownership of the firm's shares. R Square Change and its significance is calculated in relation to the control model (model 16).

EPS (β =.024, p<.05) was found to have a significant and positive association with price; consequently, hypothesis 3 is not rejected. However, in contrast to the control model (16), the full model (19) shows that BVPS (β =.814, p<.01) is also significant in explaining price. As a result, hypothesis 4 is not rejected.

Next, this thesis focuses on hypothesis 5, that the relationship between earnings and firm value is positively moderated by accounting information quality. The interaction effect EPS * DAQ (β =-.085, p<.01) was found to have a significant and negative association with price. As DAQ is an inverse measure of accounting information quality, the results support the hypothesis. Hypothesis 5 cannot be rejected at this point. Furthermore, the interaction effect BVPS * DAQ (β =4209, p<.01) was found to have a significant and positive association with price. This provides support for hypothesis 6, that the relationship between book value and firm value is moderated by accounting information quality. Again, as DAQ is an inverse measure, the directionality for this relationship is negative.

This thesis proceeds to hypothesis 7, that the relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets. The interaction effect EPS * FQ (β =.0619, p<.01) was found to have a significant and positive association with price. This provides support for hypothesis 7 and the directionality is positive. The interaction effect BVPS * FQ (β =1.074, p<.01) was also found to have a significant and positive association with price. This supports hypothesis 8, that the relationship between book value and firm value is moderated by the level of unidentifiable intangible assets. Furthermore, the results indicate that the directionality is positive for this relationship. In summary, the tests for hypothesis 7 and 8 indicate unidentifiable intangible assets do indeed moderate the value-relevance of both earnings and book value. The positive directionality indicates that the market perceives the

earnings and book value measures to be understated and compensates using a higher multiple in valuation.

To extend the hypotheses testing and analysis, this thesis finally considers if family ownership in itself may be value-relevant, and if it has a moderating effect on the value-relevance of earnings and book value. While this moderating effect is not supported by the conceptual model of this thesis, prior research that has investigated the value-relevance of ownership has assumed this form of relationship. Model 20 introduces the family ownership variable, FAMILY, as well as its interactions between earnings and book value to the control model (Model 16). None of the variables related to family ownership are shown to be significant. Thus, it is apparent that it is important to consider the actual pathways (accounting information quality and unidentifiable intangible assets) in which family ownership may be value-relevant. Model 21 introduces the family ownership variable, FAMILY, and its interactions between earnings and book value to the full model (Model 19). In effect, this model tests any residual effect that family ownership may have in excess of the effect through accounting information quality and unidentifiable intangible assets. Interestingly, the fixed effect of FAMILY is found to be significant and negative (β =-0.645, $p<.01$). Similarly, the interaction effects of FAMILY * EPS (β =-0.031, $p<.01$) and FAMILY * BVPS (β =-0.509, $p<.01$) are found to be significant and negative. These relationships imply that there is a residual negative effect of family ownership that is not captured through the pathways of accounting information quality and unidentifiable intangible assets. This residual effect is difficult to explain at this point in time, but its existence provides researchers with future potential research avenues, which will be discussed later in this thesis.

4.5 INITIAL FINDINGS

The findings thus far for hypotheses 1 to 8 are summarized in the table below. For each hypothesis, the "reject" or "do not reject" is indicated, as well as the directionality of the finding. However, these initial findings are not definitive, as they have not been subject to statistical robustness testing or testing for the sensitivity of the findings to the construct operationalization choices.

Table 4-10 Summary of initial findings

#	Hypothesis	Decision	Direction
H1	There is a relationship between family ownership and accounting information quality.	Do not reject	Positive
H2	There is a relationship between family ownership and unidentifiable intangible assets.	Do not reject	Positive
H3	There is a positive relationship between earnings and firm value.	Do not reject	Positive
H4	There is a positive relationship between book value and firm value.	Do not reject	Positive
H5	The relationship between earnings and firm value is positively moderated by accounting information quality.	Do not reject	Positive
H6	The relationship between book value and firm value is moderated by accounting information quality.	Do not reject	Negative
H7	The relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets.	Do not reject	Positive
H8	The relationship between book value and firm value is moderated by the level of unidentifiable intangible assets.	Do not reject	Positive

4.6 STATISTICAL ROBUSTNESS

This section tests if the models used to test hypotheses 1 to 8 violate any of the statistical assumptions of ordinary least squares regressions. The following four

assumptions are tested: (1) autocorrelation; (2) heteroscedasticity; (3) normality; (4) multicollinearity.

4.6.1 AUTOCORRELATION

Ordinary least squares regressions assume that the random errors are independent from each other. However, as this sample uses five years of data for testing of Hypothesis 2 to 8, the error terms from these regressions are expected to be correlated over time. Consequently, the autocorrelation assumption may be violated. The Durbin-Watson test is estimated to formally detect any autocorrelation issues in the residuals. The Durbin-Watson statistics for the models that test the hypotheses in this chapter are reported in *Table 4-11*.

Table 4-11 Durbin-Watson statistic

Hypothesis	Concept	Durbin-Watson
Hypothesis 1	Accounting Information Quality	1.948
Hypothesis 2	Unidentified Intangible Assets	.975
Hypotheses 3-8	Value-Relevance	1.335

The results in the table above confirm the expectations. While the model used to test hypothesis 1 does not suffer from autocorrelation issues, the models used to test hypothesis 2 and hypotheses 3-8 both suffer from positive autocorrelation, as the Durbin-Watson statistic for these is significantly lower than the midpoint of 2 (Chatterjee & Hadi, 2006).

To remedy the violation of the autocorrelation assumption, this thesis uses the Cochrane-Orcutt procedure as described in Neter et al. (1996). In summary, this iterative procedure estimates an autoregressive model by modifying the usual multiple regression model:

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \mathbf{L} + \beta_p X_{pt} + \varepsilon_t$$

by adding the equation

$$\varepsilon t = \rho \varepsilon t-1 + ut$$

where

$|\rho| < 1$ is the serial correlation

$$u \sim N(0, \sigma^2)$$

Using the Cochrane-Orcutt procedure, the model to test hypothesis 2 is re-estimated to correct for autocorrelation issues in the model. *Table 4-12* reports the re-estimated model results corrected for autocorrelation and provides the uncorrected model for comparison. While there are minor changes to significance levels and coefficient magnitude, the variable of interest, FAMILY, is still significant at 1% and experiences a slight increase in coefficient magnitude. Consequently, the finding for hypothesis 2 is robust after correcting for autocorrelation.

Table 4-12 Cochrane-Orcutt correction for autocorrelation in H2

Variable	**Uncorrected**	**Corrected**
(Constant)	0.803***	0.914***
	(5.63)	(4.95)
FAMILY	0.479***	0.493***
	(6.25)	(4.932)
BLOCK	0.228***	0.2***
	(3.85)	(2.628)
SIZE	-0.048***	-0.066***
	(-9.25)	(-10.144)
AGE	-0.062***	-0.038*
	(-3.52)	(-1.689)
GROWTH	0.000	-0.001
	(-0.01)	(-0.332)
BETA	0.036	0.072*
	(1.2)	(1.883)
LEVERAGE	-0.079***	-0.059***
	(-8.68)	(-6.358)
Controls - GICS Sector	YES	YES
Controls – Year	YES	YES
Adjusted R Square	0.143	0.097
Std. Error of the Est.	0.575	0.243
F	26.062	17.071
Sig.	0.000	0.000

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

Similarly, the Cochrane-Orcutt procedure is used to re-estimate the model testing hypotheses 3. The results are reported in .

Table 4-13, and both the uncorrected and corrected models are reported for comparison. While there are slight changes in the magnitudes of the coefficients, and some changes to significance levels, the conclusions from the initial findings still hold even when correcting for autocorrelation.

Table 4-13 Cochrane-Orcutt correction for autocorrelation in H3-H8

Variable	**Uncorrected**	**Corrected**
Fundamentals		
(Constant)	0.18 (0.595)	0.14 (1.038)
EPS (H3)	0.024** (2.306)	0.033*** (4.862)
BVPS (H4)	0.814*** (3.285)	0.423** (2.1)
H5-H6 - Accounting Information Quality		
DAQ	-0.427* (-1.65)	-0.415* (-1.925)
EPS * DAQ (H5)	-0.085*** (-3.717)	-0.09*** (-5.31)
BVPS * DAQ (H6)	4.209*** (10.288)	3.312*** (6.12)
H7-H8 – Unidentifiable Intangible Assets		
FQ	0.619*** (5.38)	0.712*** (5.924)
EPS * FQ (H7)	0.073*** (19.369)	0.069*** (16.759)
BVPS * FQ (H8)	1.074*** (17.247)	1.213*** (14.477)
Controls –Block holders	NO	NO
Controls - Firm Characteristics	YES	YES
Controls - GICS Sector	YES	YES
Controls – Year	YES	YES
Adjusted R Square	0.909	0.887
Std. Error of the Est.	1.327	1.102
F	507.699	315.043
Sig.	0.000	0.000

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

P is share price three months after a firm's fiscal year end. BVPS is book value of equity per share. EPS is net income per share. DAQ is the discretionary accruals quality measure as estimated using the DD (2002) model as modified by McNichols (2002). FQ is the predicted factored q score. All continuous variables are winsorized at 1% and 99%. FAMILY is a continuous variable that accounts for the percentage of family ownership of the firm's shares.

4.6.2 HETEROSCEDASTICITY

This thesis proceeds to test for heteroscedasticity in the ordinary least squares models that were used to test the hypotheses. Using the Breusch-Pagan (1979) procedure for each regression, this thesis tests whether the estimated variances of the residuals depend upon the independent variables. The results are reported in *Table 4-14*.

Table 4-14 Breusch-Pagan test for heteroscedasticity

Hypothesis	**Concept**	**Chi 2**
Hypothesis 1	Accounting Information Quality	42.57***
Hypothesis 2	Unidentified Intangible Assets	1326.27***
Hypotheses 3-8	Value-Relevance	3521.76***

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

The results indicate that all three models suffer from heteroscedasticity. To remedy this issue, this thesis follows White's (1980) correction for heteroscedasticity by estimating the robust standard errors for the coefficients in each regression. The significance levels from the robust standard error do not change for the variables in the models used to test Hypothesis 1 and 2. The model used to test hypotheses 3-8 has minor changes in significance levels; these are reported in *Table 4-15*. As shown, all previously significant variables remain significant with the exception of EPS. Thus after estimating the robust standard errors for the EPS coefficient there is now evidence to suggest that hypothesis 3 should be rejected. Naturally, due to the various interaction effects in the full model between EPS and other control variables (firm characteristics, industry, and year) the actual significance of EPS may be reduced as its importance may be better captured through its various interaction effects. The other notable change in significance relates to hypothesis 5, the interaction effect of EPS * DAQ is now significant at 10 % (exact significance level calculated at 5.8 %).

Table 4-15 White's correction in H3-H8

Variable	Original SE Sig.	Robust SE Sig.	Change
Fundamentals			
(Constant)			
EPS (H3)	**		YES
BVPS (H4)	***	**	YES
H5-H6 - Accounting Information Quality			
DAQ	*	**	YES
EPS * DAQ (H5)	***	*	YES
BVPS * DAQ (H6)	***	***	
H7-H8 – Unidentifiable Intangible Assets			
FQ	***	***	
EPS * FQ (H7)	***	***	
BVPS * FQ (H8)	***	***	

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

4.6.3 NORMALITY

The ordinary least squared technique assumes that the residuals of a regression are normally distributed. To test for this assumption, this thesis uses the Shapiro-Wilk W test for normality. The results are reported in the table below.

Table 4-16 Shapiro-Wilk W test for normality of residuals

Hypothesis	Concept	Obs	W	V	z	Prob>z
Hypothesis 1	Accounting Information Quality	570	0.96054	14.941	6.538	0.000
Hypothesis 2	Unidentified Intangible Assets	2850	0.6895	507.806	16.049	0.000
Hypotheses 3-15	Value-Relevance	2850	0.79499	335.273	14.979	0.000

As the test assumes normality, the results indicate that the normality assumption is violated for the OLS regressions used for hypotheses testing. While the robust standard errors estimated in the previous section are also robust to normality violation, this thesis proceeds to estimate bootstrapped standard errors to provide further evidence that the violation of normality does not drive the results. The bootstrap procedure follows the method of Neter et al. (1996) and uses 1,000 replications. Similarly to the results in the previous section, the significance levels for the variables in the regressions

used to test Hypothesis 1 and 2 are unchanged when using bootstrapped standard errors. In the model used to test hypotheses 3-8, there are minor changes in significance levels; these resemble the changes from the robust standard error comparison in the previous section. EPS is not found to be significant when using bootstrapped standard errors and further supports the rejection of H3.

Table 4-17 H3-H8 significance levels after bootstrapping

Variable	Original SE Sig.	Bootstrapped SE Sig.	Change
Fundamentals			
(Constant)			
EPS (H3)	**		YES
BVPS (H4)	***	*	YES
H5-H6 - Accounting Information Quality			
DAQ	*	**	YES
EPS * DAQ (H5)	***	**	YES
BVPS * DAQ (H6)	***	***	
H7-H8 – Unidentifiable Intangible Assets			
FQ	***	***	
EPS * FQ (H7)	***	***	
BVPS * FQ (H8)	***	***	

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

4.6.4 MULTICOLLINEARITY

The final diagnostic for this thesis is the test for multicollinearity. It refers to the possibility of near-linear relationships within the independent variables. In the presence of multicollinearity, the coefficients may be unstable and the standard errors inflated, meaning that possible significant results are observed to be non-significant. This thesis uses variance inflation factors (VIF) to test for the presence of multicollinearity in the main models used. As a general rule, VIF values above 5 indicate the presence of multicollinearity, but other authors use a more lenient rule of 10 (O'brien, 2007). First, the VIFs are estimated for the model that tests the relationship between family

ownership and accounting information. The results are presented in the table below and indicate that this model is not influenced by the presence of multicollinearity.

Table 4-18 Family ownership and accounting information quality - VIF diagnostics

Variable	VIF
AUDITCOM	1.04
BIG4	1.03
FAMILY	1.09
BLOCK	1.08

Next, the VIFs are estimated for the model that tests the relationship between family ownership and unidentifiable intangible assets. The results are presented in the table below. Once again, no evidence of multicollinearity amongst the independent variables is found.

Table 4-19 Family ownership and unidentifiable intangible assets - VIF diagnostics

Variable	VIF
FAMILY	1.17
BLOCK	1.15
SIZE	1.15
AGE	1.11
GROWTH	1.03
BETA	1.03
LEVERAGE	1.1
Controls - GICS Sector	YES
Controls – Year	YES

Finally, the VIFs are estimated for the main model of this thesis that tests H3-H8. The table below indicates that there is an issue with multicollinearity, as several independent variables have VIFs of above 10, the most notable ones being EPS (405.493) and BVPS (136.16). It should be noted, however, that multicollinearity causes unstable coefficients and the lack of significant relationships. Any significant relationships that are found are not driven by the presence of multicollinearity. Instead,

multicollinearity may have caused some variables to show up as insignificant when in fact they are able to explain the variation in price. The fact that EPS and BVPS both have high VIF values is not surprising, as there are many interaction variables between these variables and the control variables.

Table 4-20 Family ownership and value-relevance of accounting information - VIF diagnostics

Variable	**VIF**
Fundamentals	
(Constant)	147.74
EPS (H3)	405.93
BVPS (H4)	136.16
H5-H6 - Accounting Information Quality	
DAQ	1.37
EPS * DAQ (H5)	2.88
BVPS * DAQ (H6)	3.12
H7-H8 – Unidentifiable Intangible Assets	
FQ	2.92
EPS * FQ (H7)	3.53
BVPS * FQ (H8)	3.66

To address the issue of multicollinearity, there are several options. First, the correlated independent variables can be factored and thus form new variables. However, this method is not appropriate in this case. While the overall explanatory power of the model may increase, it would also become impossible to observe which of these factored independent variables are significant in explaining the dependent variable. Furthermore, multicollinearity causes a lack of significant relationships; in other words, significant relationships found in the model are in fact significant. The main issue is that their coefficients may be unstable and there may be independent variables that appeared non-significant but are in fact significant in explaining the variability in the price. This thesis chooses to be conservative in regards to the significance levels and accepts the

fact that EPS does not show up as significant in explaining price, as this variable in itself is not the focus of this thesis.

4.6.5 CHANGES OF FINDINGS DUE TO ROBUSTNESS TESTING

This section examined if the models used to test the hypotheses violated any of the statistical assumptions of ordinary least squares regressions. It was found that all four assumptions were violated. However, the conclusions drawn previously were still mostly robust to these violations based on additional testing. Nonetheless, after addressing for heteroscedasticity and normality issues in model 20, the conclusions regarding hypothesis 3 have changed as EPS was not shown to be significant when using robust and bootstrapped standard errors. However, the testing for multicollinearity indicated that the lack of significance could be related to the presence of multicollinearity.

4.7 ROBUSTNESS OF CONSTRUCT OPERATIONALIZATION

This section performs further robustness tests by using alternative operationalizations of the important constructs in this thesis and observing whether the results are sensitive to the choice of proxy. The constructs subjected to sensitivity testing are: (1) the family-owned firm definition; (2) the measure of accounting information quality; (3) and the measure for unidentifiable intangible assets.

4.7.1 FAMILY-OWNED FIRM DEFINITION

As mentioned in Chapter 2 and 3, the definition of family-owned firm is highly contested, as there is no accepted standard definition. This thesis used seminal prior

literature to define what constitutes a family-owned firm. In the table below, three alternative definitions (definitions 2 to 4) are provided in addition to the primary one (definition 1).

Table 4-21 Alternative definitions of family-owned firm

Definition	**Number of family-owned firms**	**Percent of sample**
1. One or more family members are shareholders, and one or more family members are officers or directors	104	18.25%
2. One or more family members are shareholders, and one or more family members are officers or directors (dummy variable)	104	18.25%
3. One or more family members are shareholders and the chief executive officer or chief financial officer is a family member	75	13.16%
4. The family has at least 20% of the votes, and the chief executive officer or chief financial officer is a family member	51	8.95%

Using these alternative definitions, this thesis now re-estimates the relevant models. First, this thesis explores the relationship between family ownership and accounting information quality (H1). The results are presented below. They indicate that the relationship between family ownership and accounting information quality is not sensitive to the family-owned firm definition. The alternative definitions (2-4) are all shown to be significant and negative, which is in line with the main findings. It should be noted that definition number 2 is a dummy variable; thus, the FAMILY coefficient magnitude is not comparable to the other definitions.

Table 4-22 Family ownership and accounting information quality – family-owned firm definition sensitivity

	Family-owned firm Definition			
Variable	**1**	**2**	**3**	**4**
(Constant)	0.048***	0.046***	0.048***	0.047***
	(3.57)	(3.437)	(3.571)	(3.526)
AUDITCOM	-0.009***	-0.008***	-0.009***	-0.009***
	(-2.743)	(-2.653)	(-2.915)	(-2.932)
BIG4	-0.036***	-0.038***	-0.037***	-0.036***
	(-3.716)	(-3.826)	(-3.761)	(-3.712)
FAMILY	-0.091***	-0.032**	-0.105***	-0.105***
	(-2.856)	(-2.582)	(-2.911)	(-2.886)
BLOCK	-0.003	0.005	0	0
	(-0.102)	(0.188)	(-0.019)	(0.009)
Adjusted R Sq.	0.051	0.048	0.051	0.051
Std. Error of the Est.	0.111	0.112	0.111	0.111
F	8.638	8.249	8.721	8.683
Sig.	0.000	0.000	0.000	0.000

This thesis proceeds to examine the relationship between family ownership and the level of unidentifiable intangible assets in the firm (H2). The results are presented below. They show that the relationship is not sensitive to the family-owned firm definition. Across all four definitions, there exists a significant and positive relationship between family ownership and the level of unidentifiable intangible assets. While the magnitude of the FAMILY coefficient varies, the direction and significance is the same across all definitions.

Table 4-23 Family ownership and unidentifiable intangible assets – family-owned firm definition sensitivity

	Family-owned firm Definition			
Variable	**1**	**2**	**3**	**4**
(Constant)	0.803***	0.775***	0.824***	0.846***
	(5.631)	(5.464)	(5.765)	(5.92)
FAMILY	0.479***	0.242***	0.409***	0.294***
	(6.245)	(8.182)	(4.776)	(3.404)
BLOCK	0.228***	0.212***	0.196***	0.173***
	(3.853)	(3.689)	(3.32)	(2.938)
SIZE	-0.048***	-0.048***	-0.048***	-0.048***
	(-9.25)	(-9.322)	(-9.203)	(-9.177)
AGE	-0.062***	-0.06***	-0.064***	-0.066***
	(-3.517)	(-3.374)	(-3.579)	(-3.683)
GROWTH	0	0	0	0
	(-0.007)	(-0.162)	(0.019)	(0.002)

	Family-owned firm Definition			
Variable	**1**	**2**	**3**	**4**
BETA	0.036 (1.203)	0.039 (1.31)	0.028 (0.952)	0.028 (0.947)
LEVERAGE	-0.079*** (-8.682)	-0.076*** (-8.475)	-0.077*** (-8.497)	-0.076*** (-8.411)
Controls – GICS Sector	YES	YES	YES	YES
Controls – Year	YES	YES	YES	YES
Adjusted R Square	0.143	0.151	0.138	0.135
Std. Error of the Est.	0.575	0.572	0.577	0.578
F	26.062	27.767	25.075	24.390
Sig.	0.000	0.000	0.000	0.000

Based on these results this thesis can conclude that the relationship between family ownership and accounting information quality is not sensitive to the family-owned firm definition choice (H1). Neither is the relationship between family ownership and unidentifiable intangible assets (H2).

4.7.2 ACCOUNTING INFORMATION QUALITY MEASURE

This thesis uses the DD (2002) model as modified by McNichols (2002) to estimate discretionary accruals quality and operationalize the construct of accounting information quality. This section re-estimates the models in this thesis using an alternative discretionary accruals model: the modified Jones model (Dechow et al., 1995). Using all the firms in the sample, a cross-sectional regression is estimated for each year and each GICS sector as follows:

$$WC_{i,t} = \beta_0 + \beta_1[\frac{1}{Assets_{i,t-1}}] + \beta_2[\frac{\Delta Sales_{i,t} - \Delta AR_{i,t}}{Assets_{i,t-1}}] + \beta_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t} \qquad (22)$$

where the subscript *i* indicates firm *i*, *ΔSales* is the change in sales, *PPE* is net property, plant and equipment, and *ΔAR* is the change in accounts receivable. The

residual in equation (21) is the discretionary accruals, estimated from the modified Jones model and alternatively measures accounting information quality.

Using this measure, this thesis re-examines the relationship between family ownership and accounting information quality. The findings in the table below show that the results are sensitive to the choice of discretionary accruals quality model. When using the modified Jones model (Dechow et al., 1995) no relationship between family ownership and accounting information quality is observed. However, the findings also show that the control variables of AUDITCOM and BIG4 are also insignificant. Intuitively, these two control variables should influence accounting information quality, and, as they are not significant, it could be suggested that the modified Jones model is too noisy. Francis et al. (2005) considers the modified Jones model to be a noisy measure because it considers a large portion of the accruals as abnormal and only controls for a limited number of fundamental characteristics of the firm.

Table 4-24 Family ownership and accounting information quality – accounting information quality measure sensitivity

Variable	**DD Model**	**Modified Jones Model**
(Constant)	0.048***	0.037
	(3.57)	(1.178)
AUDITCOM	-0.009***	-0.005
	(-2.743)	(-0.661)
BIG4	-0.036***	-0.01
	(-3.716)	(-0.426)
BLOCK	-0.003	-0.004
	(-0.102)	(-0.048)
FAMILY	-0.091***	-0.053
	(-2.856)	(-0.895)
Adjusted R Square	0.051	-0.004
Std. Error of the Est.	0.111	0.263
F	8.638	0.434
Sig.	0.000	0.784

Next, this thesis investigates the sensitivity of the moderating effect of accounting information quality on the value-relevance of both earnings and book value.

The main results are re-estimated and presented below. The main findings appear to be the same; the two-way interactions of EPS * DAQ (H5) and BVPS * DAQ (H6) maintain both their significance and directionality. Consequently, this result is not sensitive to the choice of accounting information quality model. The only noticeable change in the results is that book value is no longer shown to be value-relevant as a main effect (H4). However, the book value effect is captured through the multiple interactions in the model between BVPS and other variables.

Table 4-25 Value-relevance of accounting information – accounting information quality measure sensitivity

Variable	**DD 2002**	**Modified Jones**
Fundamentals		
(Constant)	0.18 (0.595)	0.27 (0.884)
EPS (H3)	0.024** (2.306)	0.033*** (3.134)
BVPS (H4)	0.814*** (3.285)	0.391 (1.569)
H5-H6 - Accounting Information Quality		
DAQ	-0.427* (-1.65)	-0.077 (-0.723)
EPS * DAQ (H5)	-0.085*** (-3.717)	-0.028*** (-4.223)
BVPS * DAQ (H6)	4.209*** (10.288)	0.492*** (4.688)
H7-H8 – Unidentifiable Intangible Assets		
FQ	0.619*** (5.38)	0.645*** (5.628)
EPS * FQ (H7)	0.073*** (19.369)	0.075*** (19.722)
BVPS * FQ (H8)	1.074*** (17.247)	0.984*** (15.583)
Controls - Firm Characteristics	YES	YES
Controls - GICS Sector	YES	YES
Controls – Year	YES	YES
Adjusted R Square	0.909	0.905
Std. Error of the Est.	1.327	1.352
F	507.699	487.592
Sig.	0.000	0.000

4.7.3 UNIDENTIFIABLE INTANGIBLE ASSETS MEASURE

In this thesis, a new experimental variable was developed to operationalize the construct of unidentifiable intangible assets. This variable was Factored *q*, FQ, and was a one-factor solution of the variables Tobin's *q*, industry-adjusted Tobin's *q*, and hedonic *q*. An alternative way to measure unidentifiable intangible assets that may be easier to understand would be to group the sample firms into two groups: those with low levels of unidentifiable intangible assets and those with high levels of unidentifiable intangible assets. Using this method, firms with above median Tobin's *q* were coded as 1 for the alternative FQ measure and firms below median Tobin's *q* were coded as 0 for FQ. This coding effectively created a high intangibility dummy.

This thesis then proceeds to re-examine the relationship between family ownership and unidentifiable intangible assets using this new measure. However, as this measure is categorical and not continuous, a logit regression was employed using the independent variables to predict their statistical significance in explaining membership in group 1 (high intangibility). The results are shown below. They indicate that the results of this relationship are indeed sensitive to the measure used to operationalize unidentifiable intangible assets. FAMILY is not found to be significant in predicting group membership in the high intangibility group. Interestingly, BLOCK is still shown to be significant using this alternative operationalization. Furthermore, additional sensitivity testing is performed by re-estimating the original model (OLS) using the original components of the FQ measure, namely the three variations of Tobin's *q*, as the dependent variable. These results are reported in Appendix D, and show that each of the three variations produces qualitatively similar results as the factored FQ measure.

Table 4-26 Family ownership and unidentifiable intangible assets – unidentifiable intangible assets measure sensitivity

Variable	**beta (z-test)**
(Constant)	-0.19***
	(0.759)
FAMILY	28.861
	(0)
BLOCK	0.141***
	(0.577)
SIZE	-0.047***
	(0.031)
AGE	-0.136***
	(0.072)
GROWTH	0.003***
	(0.792)
BETA	0.228***
	(0.077)
LEVERAGE	-0.782***
	(0)
Controls - GICS Sector	YES
Controls – Year	YES
chi2(19)	1228.97
chi2	0
Log likelihood	-1360.9826
Pseudo r2	0.3111

Next, the moderating role of unidentifiable intangible assets in the value-relevance of earnings and book value is subjected to sensitivity testing. The results are presented below. The findings show that the moderating role of unidentifiable intangible assets is not sensitive to the measure utilized, as the significance and directionality is maintained when using the alternative dummy variable for FQ. Several other hypotheses, EPS (H3), BVPS (H4), and EPS * DAQ (H5), are no longer significant in explaining the variation in price. Thus, these relationships are sensitive to the operationalization of unidentifiable intangible assets.

Table 4-27 Value-relevance of accounting information – unidentifiable intangible assets measure sensitivity

Variable	Original FQ	Dummy FQ
Fundamentals		
(Constant)	0.18 (0.595)	0.05 (0.136)
EPS (H3)	0.024** (2.306)	0.009 (0.708)
BVPS (H4)	0.814*** (3.285)	0.099 (0.331)
H5-H6 - Accounting Information Quality		
DAQ	-0.427* (-1.65)	0.041 (0.134)
EPS * DAQ (H5)	-0.085*** (-3.717)	-0.024 (-0.869)
BVPS * DAQ (H6)	4.209*** (10.288)	2.973*** (6.017)
H7-H8 – Unidentifiable Intangible Assets		
FQ	0.619*** (5.38)	0.343*** (4.488)
EPS * FQ (H7)	0.073*** (19.369)	0.046*** (11.947)
BVPS * FQ (H8)	1.074*** (17.247)	0.299*** (5.384)
Controls - Firm Characteristics	YES	YES
Controls - GICS Sector	YES	YES
Controls – Year	YES	YES
Adjusted R Square	0.909	0.866
Std. Error of the Est.	1.327	1.608
F	507.699	329.975
Sig.	0.000	0.000

4.8 SUMMARY OF RESULTS

This chapter provided empirical tests of the hypotheses presented in this thesis. The results showed that family ownership is positively related to accounting information quality (H1) and the level of unidentifiable intangible assets in the firm (H2). This relationship implies that family-owned firms report higher-quality accounting information and more *faithfully represen*t the underlying economic nature of their firms. They also appear to have a higher level of unidentifiable intangible assets. The sensitivity analysis also confirmed that the findings for these two hypotheses is not

sensitive to the family-owned firm definition, but is sensitive to the choice of measure for accounting information quality and unidentifiable intangible assets respectively. When using the alternative measure for accounting information quality, no significant relationships between family ownership and accounting information quality are found (H1). Furthermore, when using the alternative measure for unidentifiable intangible assets, the relationship between family ownership and unidentifiable intangible assets is not shown to be significant (H2).

The results also indicate that there are positive relationships between earnings and firm value (H3) as well as book value and firm value (H4). However, the significance levels for the relationships were sensitive to model specification and statistical robustness.

Accounting information quality was found to positively moderate the relationship between earnings and firm value (H5), while negatively moderating the relationship between book value and firm value (H6). This trend implies that when firms report high-quality accounting information, the market increases the weight on their earnings and decreases the weight on their book value. However, the negative moderating effect for book value does not imply that reporting high-quality information is undesirable, as the results merely show that there appears to be a trade-off between the weighting on earnings and book value, not the firm value itself. These results are not sensitive to either the choice of family-owned firm definition or the choice of accounting information quality measure.

Furthermore, it was found that the relationship between earnings and firm value is positively moderated by the level of unidentifiable intangible assets (H7), and the relationship between book value and firm value is also positively moderated by unidentifiable intangible assets (H8). These relationships imply that when firms have

an increase in unidentifiable intangible assets, the market increases the multiple it pays for their earnings and book value. As such, the market realises that both the earnings and book values of these firms are understated. These results are not sensitive to either the choice of family-owned firm definition or the choice of unidentifiable intangible assets measure.

Table 4-28 Summary of results

Hypothesis	Expected direction	Observed direction	Robust direction	Sensitivity		
				Family-owned firm definition	Accounting information quality measure	Unidentifiable intangible assets measure
H1: There is a relationship between family ownership and accounting information quality.	?	+	+	+	N.S.	+
H2: There is a relationship between family ownership and unidentifiable intangible assets.	?	+	+	+	+	N.S.
H3: There is a positive relationship between earnings and firm value.	+	+	N.S.	+	+	N.S.
H4: There is a positive relationship between book value and firm value.	+	+	+	N/A	N.S.	N.S.
H5: The relationship between earnings and firm value is positively moderated by accounting information quality.	+	+	+	N/A	+	N.S.
H6: The relationship between book value and firm value is moderated by accounting information quality.	?	-	-	N/A	-	-
H7: The relationship between earnings and firm value is moderated by the level of unidentifiable intangible assets.	?	+	+	N/A	+	+
H8: The relationship between book value and firm value is moderated by the level of unidentifiable intangible assets.	?	+	+	N/A	+	+

N.S. stands for not significant.
N/A stands for not applicable.

Chapter 5: Discussion and Conclusion

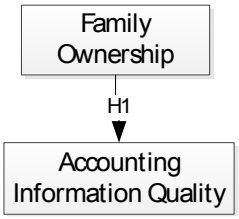
This thesis investigated the relationship between family ownership and the value-relevance of accounting information. The theoretical development in Chapter 2 proposed that the value-relevance of accounting information is moderated by its qualitative characteristics, specifically by its *faithful representation* and *relevance*. These moderators were established through normative theory derived from accounting standards and from positive theories developed through research. This thesis posited that family ownership is indirectly related to the value-relevance of accounting information, through its relationships to the two moderators *faithful representation* and *relevance*, which were operationalized as accounting information quality and unidentifiable intangible assets. This chapter contains the discussion and conclusions that can be drawn from the results that were presented in Chapter 4. The hypotheses are first discussed separately; afterwards, the results and conclusions from all hypotheses

are merged to unravel a higher order understanding of the contribution made in this thesis. Finally, the limitations and future research opportunities are discussed.

5.1 H1: FAMILY OWNERSHIP AND ACCOUNTING INFORMATION QUALITY

This thesis investigated the association between family ownership and accounting information quality (*faithful representation*) as proxied by discretionary accruals quality. It has been suggested that the traditional owner-manager agency conflict, *Type I* agency problem, is mitigated in publically listed family-owned firms (Anderson et al., 2003; Demsetz & Lehn, 1985; Villalonga & Amit, 2006). Nevertheless, the concentration of ownership and management in these firms leads to *Type II* agency problems, as the family may act opportunistically and expropriate wealth from the firm at the expense of minority shareholders.

Figure 5-1 Family ownership and accounting information quality



Given this interesting agency context, considerable research has been conducted in this area. Prior studies have found conflicting evidence regarding this relationship. Studies from the US show a positive relationship between family ownership and accruals quality (Ali et al., 2007; Wang, 2006), while some non-US studies show a negative relationship (Kim & Yi, 2006; Prencipe et al., 2008; Yang, 2010). However, this prior work shares a common theme: it uses accruals quality measures that do not discriminate between accruals arising from the economic fundamentals of the firm and

accruals arising from earnings management. These economic fundamentals have been found to drive accruals in prior research, both in a US setting (Dechow & Dichev, 2002; Francis et al., 2005), and, more recently, within the Australian setting (Aldamen & Duncan, 2011; Kent et al., 2010). These studies have found that, when considering economic fundamentals of the firm, the conclusions regarding what drives accruals quality may change (Francis et al., 2005). Consequently, the existing evidence regarding the association between family ownership and accruals quality is not convincing.

This thesis thus extended the research in this area by decomposing the accruals quality measure into innate and discretionary accruals and focusing on the relationship between family ownership and discretionary accruals specifically. It was found that family ownership is positively associated with accounting information quality. The evidence, which includes controls for governance, is consistent with Wang's (2006) US evidence, indicating that family ownership has a positive relationship with accounting information quality. However, the findings of this thesis provide evidence that this effect is specific to discretionary accruals. The results imply that family ownership should be considered to be a sound governance mechanism, specifically in Australia, where high investor protection can mitigate the *Type II* agency problems that have been found to be present in other countries (La Porta et al., 1999).

Furthermore, the results are not sensitive to the definition of family-owned firm. Three alternative family-owned firm definitions were used in the sensitivity analysis, and the results are consistent across all alternative definitions, showing that family ownership is positively related to accounting information quality.

However, the results are sensitive to the operationalization of accounting information quality. No relationship between family ownership and accounting information quality was found when using the modified Jones model to estimate the

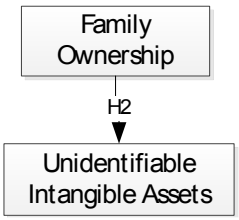
discretionary component of accrual. The alternative proxy was also not related to either the use of Big 4 auditors, number of members on the audit committee, or the level of block-holding within the firm. Consequently, it could be suggested that the alternative proxy may not be a suitable measure for accounting information quality as it was not related to either of the control variables and could instead represent white noise. This may also explain why recent research in the Australian setting has been using the DD (2002) model as modified by McNichols (2002) (Aldamen & Duncan, 2011; Kent et al., 2010).

Considering the results in conjunction with the findings from the sensitivity testing, this thesis provides evidence of a positive relationship between family ownership and accounting information quality. Furthermore, the results are robust to alternative family-owned firm definitions but are sensitive to the choice of proxy for accounting information quality.

5.2 H2: FAMILY OWNERSHIP AND UNIDENTIFIABLE INTANGIBLE ASSETS

This thesis also investigated the relationship between family ownership and the level of intangible assets within the firm. Prior research indicates that the nature of family-owned firms leads to an accumulation of unidentifiable intangible assets (Hasso & Duncan, 2012; Sirmon & Hitt, 2003).

Figure 5-2 Family ownership and unidentifiable intangible assets



The long-term orientation of the family alters the managerial practices within the firm. First, the family name is often intertwined with the firm. The family has an incentive to build the firm's brand by building strong relationships with customers and suppliers. Second, family-owned firms also tend to focus more heavily on human capital-developing activities. Due to their emotional connections to their firms, families usually provide workplaces not exclusively driven by the profit motive. This thesis operationalized the construct of unidentifiable intangible assets by using Tobin's *q*. While accounting research and family-owned firm research has primarily used Tobin's *q* as a measure of firm value, there exists a body of research that uses it as a measure of the intangible assets within a firm (Lev, 2001; Villalonga, 2004). The findings of prior family-owned firm research were used to support the developed hypotheses, as these studies often found a positive relationship between family ownership and Tobin's *q* (Hasso & Duncan, 2012). This thesis posited that Tobin's *q* was actually a proxy for unidentifiable intangible assets. Furthermore, to improve the research design, this thesis considered the following alternative Tobin's *q* measures: an industry-adjusted measure, and a hedonic *q* measure developed by Villalonga (2004). These three *q* measures were factored into one variable that was used as a proxy for the level of unidentifiable assets within each firm. The choice to use a one-factor solution was driven by the desire to summarize the variation in the three different, yet related, estimations of *q*.

This thesis found that family ownership is positively related to the level of unidentifiable intangible assets in the firm. We can, therefore, conclude that family-owned firms tend to hold more unidentifiable intangible assets than non-family-owned firms. Although the family may negatively affect social capital through family feuds and human capital through nepotism, the results indicate that the positive impact of the family outweighs any negative impact.

Furthermore, the result was subjected to sensitivity testing. It was found that the result was not driven by the choice of family-owned firm definition as it was found that all three alternative definitions of family-owned firm also showed a positive relationship with unidentifiable intangible assets. This thesis also provides an alternative way of operationalizing the unidentifiable intangible assets within the firm in the sensitivity tests. A dummy variable was created, and firms that had above-median levels of Tobin's *q* were considered to be highly intangible while firms that had below median values for Tobin's *q* were considered to be of low intangibility. Using this alternative definition, a logit regression was used to predict group membership. This sensitivity test did not find any relationship between family ownership and unidentifiable intangible assets. Consequently, the finding for this hypothesis is sensitive to the unidentifiable intangible assets definition and operationalization.

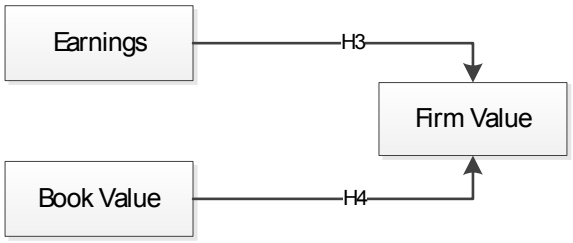
In summary, this thesis found a positive relationship between family ownership and unidentifiable intangible assets. The results were robust to alternative definitions of what constitutes a family-owned firm, but were sensitive to the operationalization of unidentifiable intangible assets.

5.3 H3 AND H4: THE VALUE-RELEVANCE OF EARNINGS AND BOOK VALUE

The tests of the two first hypotheses found evidence of a relationship between family ownership and accounting information quality as well as unidentifiable intangible assets. Having established these relationships, this thesis proceeded to examine the value-relevance of accounting information.

Prior literature has established that firm value can largely be explained by earnings and book value. While other relevant factors may impact value, these two accounts measures are commonly accepted as crucial for valuation (Collins et al., 1997).

Figure 5-3 The relationship between earnings and book value and firm value



This thesis examined the value-relevance of earnings and book value through a traditional value-relevance methodology using the levels approach. Alternatively, it could have considered the changes in each of these accounting items; however, research has found that the changes approach is not suitable when the study has a focus on the book value of the firm (Barth et al., 1998a; Kothari & Zimmerman, 1995). As a result, this thesis used a levels approach. It was found that both earnings and book values were indeed value-relevant, as there was a significant and positive association between earnings and firm value as well as between book value and firm value. However, their value-relevance was sensitive to testing for statistical and construct operationalization robustness. This is most likely attributed to the fact that this thesis considered several control variables such as size, growth, leverage, negative earnings, year, and industry. In addition to using these control variables as fixed effects, each control variable was interacted with earnings and book value. As such, while earnings or book value may not appear as significant, as several of the control interactions with earnings and book value were still significant, their value-relevance was captured through these indirect relationships. Nonetheless, the value-relevance of earnings and book value was not at the core of this thesis and its contribution; rather, this thesis discussed how their value-

relevance is moderated by accounting information quality and unidentifiable intangible assets.

5.4 H5 AND H6: THE MODERATING ROLE OF ACCOUNTING INFORMATION QUALITY

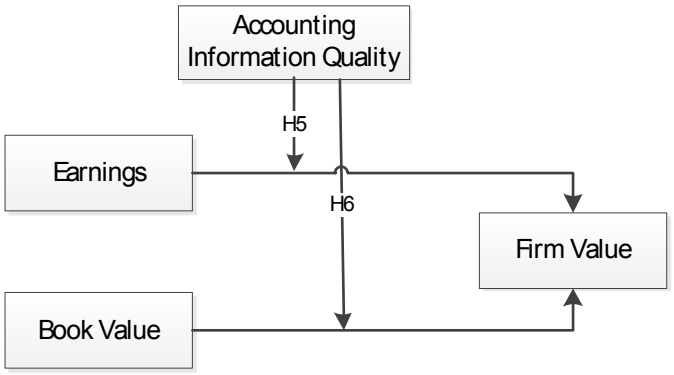
While value-relevance researchers appear to agree that not all information is equal, surprisingly little research has investigated the moderating impact of accounting information quality or earnings management upon the value-relevance of earnings and book value.

The limited evidence available suggests that accounting information quality is value-relevant and that when the quality is high then the value-relevance of earnings increases. Christensen et al. (1999) found a negative relationship between the incentives for earnings management and the information content of earnings. Similarly, Marquardt and Wiedman (2004) found that the value-relevance of earnings decreases for firms where there is ex-post evidence of earnings management. Whelan and McNamara (2004) provided additional insights by differentiating between not only discretionary and non-discretionary accruals, but also by decomposing discretionary accruals into two components: short-term discretionary accruals and long-term discretionary accruals. In accordance to the authors' expectations, they found that earnings management via long-term discretionary accruals has a greater impact upon the value-relevance of earnings and book value as compared to via short-term discretionary accruals.

Furthermore, the IFRS conceptual framework stresses that *faithful representation* is a primary characteristic of decision-useful information. In conjunction with the established evidence, this criterion necessitated this thesis to consider the role of accounting information quality in the conceptual model. As such, the moderating role of

accounting information quality on the value-relevance of earnings and book value was investigated.

Figure 5-4 The moderating role of accounting information quality



This thesis used the DD (2002) model as modified by McNichols (2002) to estimate discretionary accruals quality and thus empirically operationalize accounting information quality at the firm level. The results showed that accounting information quality is indeed value-relevant. It was found that firms that supplied accounting information of high quality had a higher weight (coefficient magnitude) upon their earnings; as such, accounting information quality positively moderated the relationship between earnings and firm value. Conversely, the weighting placed upon book value is decreased for these firms as the valuation shifts to a more earnings-based valuation. Thus, accounting information quality negatively moderates the relationship between book value and firm value. These results were then subjected to sensitivity testing using the modified Jones model to estimate the discretionary accruals quality on a firm level. The sensitivity test showed that the results were not sensitive to the choice of discretionary accruals model.

In summary, this thesis provided further evidence of the importance of accounting information quality for value-relevance research. The results show that accounting information quality positively (negatively) moderates the relationship between earnings

(book value) and firm value. These results are robust to the use of an alternative proxy in the estimation of accounting information quality.

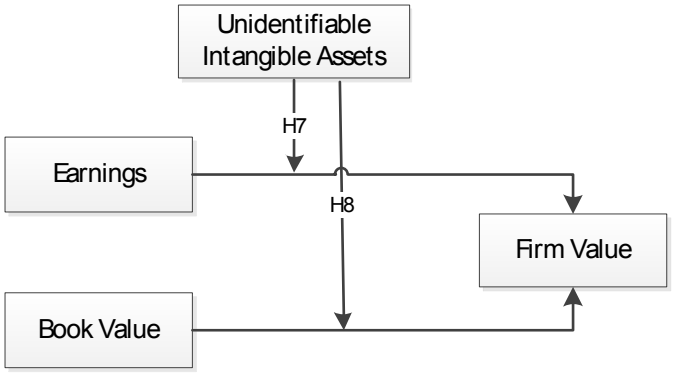
5.5 H7 AND H8: THE MODERATING ROLE OF UNIDENTIFIABLE INTANGIBLE ASSETS

In addition to investigating the moderating role of accounting information quality, this thesis also investigated the moderating role of unidentifiable intangible assets. In this respect, this thesis provided the first empirical test of its kind. Previous research has primarily noted that the accounting standards were deficient in recognizing intangible assets of firms, and specifically the unidentifiable intangible assets components of social capital (brand value) and human capital. For example, Barth et al. (1998) found that brand value estimates are value-relevant and provide incremental information content beyond earnings and book value when explaining the variation in firm value. However, as the brand is only one part of the unidentifiable intangible assets held by firms, the existing evidence may not have recognized the entire problem. This is also supported by Amir and Lev (1996), who found that the value-relevance of accounting information is lower in industries that tend to have higher levels of unidentifiable intangible assets.

This thesis borrowed from the management literature and used Tobin's *q* to estimate the unidentifiable intangible assets within each firm. However, given that Tobin's *q* is inherently related to firm value, the measure in itself is not appropriate to use in value-relevance models, as it would introduce simultaneous equation bias. This could perhaps explain why it has not been used for this purpose in the past. To address this issue, this thesis used a two-stage least squares technique to regress each firm's unidentifiable intangible asset measure upon variables that could explain the variation and used the predictive value of this regression for the final measure for unidentifiable

intangible assets. This remedied simultaneous equation bias and ensured that the variable still accounted for part of the variation in unidentifiable intangible assets holdings on a firm level. Using this measure, it was found that unidentifiable intangible assets moderate the value-relevance of earnings and book value.

Figure 5-5 The moderating role of unidentifiable intangible assets



It was found that unidentifiable intangible assets positively moderated the relationships between both earnings/firm value and book value/firm value. In other words, firms that hold a high level of unidentifiable intangible assets are observed to be valued at a higher earnings and book value multiple. This confirmed much of the prior literature, which had noted that Tobin's *q* is not an overall firm value measure but rather an outcome of understated book values stemming from unidentifiable intangible assets (Hasso & Duncan, 2012; Villalonga, 2004).

These results were subject to sensitivity testing using a simple grouping of firms into low and high intangibility categories based on their Tobin's *q* in relation to the median. The sensitivity testing showed that the results were not sensitive to the measure used in the primary analysis.

5.6 THE COMPLETE PICTURE

This thesis examined the relationship between family ownership and the value-relevance of accounting information. Prior research in this area was sparse and limited. This thesis addressed this gap by providing a deeper understanding of the issue in Chapter 2, by considering the exact pathways of how family ownership could affect the value-relevance of accounting information. Based on the review of both value-relevance and family-owned firm research, it was found that family ownership can potentially impact the value-relevance of accounting information through its relationships to the qualitative characteristics of accounting information, as operationalized by accounting information quality and unidentifiable intangible assets. The notion that the value-relevance of accounting information would be impacted by these two constructs is supported by prior research and by the IFRS conceptual framework. Thus, this thesis used both a normative and a positive lens in constructing a conceptual model.

The results showed positive relationships between family ownership and accounting information quality and between family ownership and unidentifiable intangible assets. These results suggest that family-owned firms supply accounting information of higher quality, as they have lower discretionary accruals, and this behavior implies that the reduction in Type I agency conflicts outweigh the potential increased Type II agency conflicts. Additionally, the results also support the notion that family ownership is positively related to the level of unidentifiable intangible assets within the firm. This result, the family effect on the increase in unidentifiable intangible assets, outweighs any potential detrimental effects due to nepotism or family feuds.

Furthermore, accounting information quality and unidentifiable intangible assets were found to have an impact on the value-relevance of accounting information. Accounting information quality, operationalized as discretionary accrual quality, was

found to have a positive relationship with the value-relevance of earnings, while it had a negative relationship with the value-relevance of book value. These relationships suggest that firms that report information of poor quality are valued more based on their book value rather than on their earnings. It was also found that unidentifiable intangible assets had a positive relationship with the value-relevance of earnings and book value. This suggests that the market recognizes that both the earnings and book values of firms are understated relative to their holdings of unidentifiable intangible assets; therefore, it uses a higher multiple for earnings and book value in the valuation process.

The results in Chapter 4 also considered the simple model of a direct family effect upon the value-relevance of earnings and book value as suggested by Cascino et al. (2010); however, no significant relationships were found. This result supported the conceptual model that had no direct link between family ownership and the value-relevance of earnings and book value. However, when controlling for both accounting information quality and unidentifiable intangible assets, it was found that there was an unexplained negative family effect on both the value-relevance of earnings and book value. There was also a negative fixed effect based on the level of family ownership. In large, these unexplained effects suggest that there is still variation in price that cannot be explained by accounting information quality and unidentifiable intangible assets. It is also noteworthy that this residual family effect is negative on the whole.

The unexplained family effect could be partially driven by the choice of proxies in the operationalization of constructs such as accounting information quality and unidentifiable intangible assets. If the proxies are not able to capture the underlying construct to the full extent, and if there is a systematic ownership bias in their deficiency, then there would be an unexplained family effect. However, it could also potentially be attributed to the notion that investors do not value accounting information

quality in the same way for both family and non-family-owned firms. Thus, if investors demand higher accounting information quality from family-owned firms in order to be assured that no Type II issues exist; then perhaps family-owned firms are penalized more heavily for reporting poor-quality accounting information than non-family-owned firms are.

In summary, this thesis provides evidence that the conceptual model presented in Chapter 2 does in fact hold true, and documents a more refined pathway for the relationship between family ownership and the value-relevance of accounting information. However, the results also suggest that there are still unexplained family effects, and provide avenues of future research in this area.

5.7 IMPLICATIONS OF THIS THESIS

This section discusses the implications of this thesis. Specifically, it describes the implications for research, policy makers, and users of financial information.

5.7.1 IMPLICATIONS FOR RESEARCH

This thesis has provided a number of important findings with implications for theory. Prior research suggested that accounting information quality moderates the value-relevance of accounting information. This thesis has confirmed this proposition and introduced the importance of unidentifiable intangible assets and how this concept can be controlled for in value-relevance studies. Based on the explanatory power of the models in this thesis, it is also shown that unidentifiable intangible assets provide significant additional explanatory power for firm value above and beyond that of accounting information quality.

This thesis has also shown that family ownership is associated with higher levels of unidentifiable intangible assets. This discovery has implications for any research that utilizes accounting information in its models. For example, prior research has utilized Tobin's *q* as measure for firm value and often found that family-owned firms are valued higher by the market. However, this thesis proposed and found evidence suggesting that the higher Tobin's *q* values are not an outcome of higher firm values but rather a greater understatement of the true assets of family-owned firms, and the market's recognition of this deficiency has led to inflated Tobin's *q* values. Any performance studies that use accounting-based performance ratios should limit their conclusions to accounting performance rather than true performance.

5.7.2 IMPLICATIONS FOR POLICY MAKERS

The implications for policy makers primarily stems from the evidence this thesis has provided regarding the value-relevance of unidentifiable intangible assets. The accounting standards have long been considered deficient when accounting for intangible assets (Cañibano et al., 2000). This thesis provides further evidence of this concern by showing that the market considers these unidentifiable intangible assets, and that they are represented in the market values of firms. While policy makers and standard setters may perceive this to be sufficient in the sense that the market adjusts for these unidentifiable intangible assets, the market's adjustment is most likely crude and, as such, markets may not be operating at optimal efficiency. Additionally, through ignoring these unidentifiable intangible assets and not regulating their relevant information, users may sometimes be misled. Barth et al. (1998) showed that brand value estimates by the Financial Times are value-relevant. This introduces an interesting issue: while the estimates provided by the Financial Times and other providers may be

used for valuation purposes by investors, this information is not audited and there is little investor protection when it comes to the reliability of this information. Thus, the current conservative policy of not recognizing all intangible assets may in fact be introducing greater uncertainty and risk in the market.

5.7.3 IMPLICATIONS FOR USERS OF FINANCIAL STATEMENTS

This thesis has shown that family ownership is associated with higher-quality accounting information and a higher level of unidentifiable intangible assets in firms. These two concepts are important for users of financial statements, as these statements merely present the amounts that are recognized according to the accounting standards. These accounting standards do not consider the quality of the amount recognized and the unrecognized intangible assets that do not qualify for recognition on financial statements. The quality of the accounting information assures the investors that they may rely on the information supplied, and the book value of firms provides investors with an understanding of the resources of the firm. However, as these two concepts are systematically different for family-owned firms, it becomes important for investors to delineate between family-owned firms and non-family-owned firms.

5.8 LIMITATIONS OF THIS THESIS

This section discusses the notable limitations of this thesis and considers how these limitations may have impacted the findings and, in turn, the conclusions made. This thesis used Australia as its study context. As such, the findings of this thesis may not be generalizable to other markets. Australia has a highly developed financial market with strong legal protection mechanisms (La Porta et al., 1999). This thesis found that

family ownership is associated with high accounting information quality. This could be partially explained by the legal system in Australia and its ability to protect minority shareholders from asset expropriation. In countries with weak minority shareholder protection laws, the observed relationship may not hold. However, this limitation should not be particularly significant to generalizations made about family-owned firms in other highly developed markets. Additionally, the Australian stock market is much smaller than, for example, the U.S. stock market; thus the findings may not be applicable to the largest of firms in these highly developed markets.

This thesis also suffers from survival bias, as the accounting information quality measure used effectively required eight years of financial data to estimate. This biases the sample toward larger and more stable firms. As such, the results may not be generalizable to all firms, especially younger and smaller firms. However, the usage of these larger and more stable firms will most likely also decrease the variation in their accounting information quality measure; in turn, this would decrease the chance of finding significant relationships. Hence, any significant relationships found in this thesis are strong enough to withstand such effects. Furthermore, the sample excluded firms in the financial services sector. While this presents a limitation to the generalizability of the findings to this particular sector, it is common practice in capital markets research to remove firms within this industry due to their distinctive regulatory situation.

Arguably, the primary limitation of this thesis stems from construct validity. This thesis and its theoretical development presented linkages between constructs, such as: family-owned firms, unidentifiable intangible assets, and accounting information quality. The methods used to operationalize them were grounded in prior literature to increase construct validity. However, as earnings management models are controversial and highly debated, the fact that they have been used in prior research may not in itself

guarantee construct validity. Similarly, there is no commonly accepted definition of what constitutes a family-owned firm, especially in the listed firm context. Furthermore, to operationalize unidentifiable intangible assets, this thesis used a new measure. While the measure was grounded in prior research, it had not been applied in a value-relevance context before. To address the issues relating to construct validity, this thesis used alternative operationalizations for all important constructs in the sensitivity analysis. This not only increases the construct validity of this thesis but also minimizes mono-operational bias.

Furthermore, the family-owned firm definition employed in this thesis was restricted to firms that were founded by the family and not just firms where the family holds significant ownership. This choice was based on prior seminal work of Anderson and Reeb (2003) and Villalonga and Amit (2006). However, this means that any firm where there is a family who is a block-holder (but is not the founding family of the firm) is classified as a nonfamily firm. Additionally, as the alternative family-owned firm definitions used in the sensitivity testing were also restricted to founding family firms, the results of this thesis may not be generalizable to family-owned firms that were not founded by the family.

5.9 FUTURE RESEARCH

The theoretical model of this thesis and the findings provide numerous opportunities for future research. This section provides an overview of some of these potential opportunities. First, it would be extremely beneficial to test the theoretical development of this thesis in a different country setting. Such a test would also address a limitation of this thesis, namely that it is based in an Australian context. Future researchers would provide a great contribution by examining if the proposed

relationships hold in other countries. In particular, it would be interesting to investigate these issues in countries that don't have highly developed markets and legal mechanisms. In these countries, the family may have a higher incentive to act opportunistically and expropriate wealth from minority shareholders. This thesis provided an empirical test of the accounting standards, operationalizing the construct of *relevance* by measuring the level of unidentifiable intangible assets within a firm. Prior research had only considered one part of the qualitative characteristics in value-relevance studies, namely the construct of faithful representation that has often been operationalized by earnings management. As this thesis provided a way to operationalize both *relevance* and *faithful representation*, it would be fruitful to explore this relationship in more detail in other countries.

Furthermore, this thesis used publically listed firms in its sample. As the majority of firms in the world are in fact private firms, it would be a great contribution to explore the theoretical model in a private firm setting. The relationships observed could potentially differ in a private firm setting, as there is lower transparency in these markets. However, future researchers should take care, as the dependent construct in this thesis is firm value. The lower efficiency in private markets could potentially be a major limitation for this type of future research.

5.10 CONCLUSION

In summary, this thesis investigated the value-relevance of family ownership. It was found that value-relevance of earnings and book value was moderated by accounting information quality and unidentifiable intangible assets. Family ownership was, in turn, found to be related to higher accounting information quality and a higher level of unidentifiable intangible assets. As such, family ownership may be considered

value-relevant through its effects on firms' accounting information quality and unidentifiable intangible assets. Furthermore, an unexplained family effect was also found after controlling for the effect of accounting information quality and unidentifiable intangible assets.

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Appendices

APPENDIX A: FACTOR ANALYSIS

Descriptive statistics

Variable	Mean	StDev	n
Tobin's *q*	2.338	9.495	2850
Industry-adjusted *q*	.000	9.367	2850
Hedonic *q*	.013	.266	2850

Correlations

	Tobin's *q*	Industry-adjusted *q*	Hedonic *q*
Tobin's *q*	1.000	.987	.135
Industry-adjusted *q*	.987	1.000	.092
Hedonic *q*	.135	.092	1.000

KMO and Bartlett's Test

Test	Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.474
Bartlett's Test of Sphericity	
Approx. Chi-Square	10543.301
df	3
Sig.	0.000

Total variance explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.012	67.066	67.066	2.012	67.066	67.066
2	.975	32.516	99.582			
3	.013	.418	100.000			

Component matrix

	Component 1
Tobin's *q*	.993
Industry-adjusted *q*	.988
Hedonic *q*	.222

APPENDIX B: HYPOTHESIS 2 COMPLETE RESULTS

Full results for Hypothesis 2

Variable	**beta (t-stat)**	**beta (t-stat)**
(Constant)	0.903***	0.803***
	(6.349)	(5.631)
FAMILY		0.479***
		(6.245)
BLOCK		0.228***
		(3.853)
SIZE	-0.046***	-0.048***
	(-8.906)	(-9.25)
AGE	-0.072***	-0.062***
	(-4.066)	(-3.517)
GROWTH	0.000	0.000
	(-0.009)	(-0.007)
BETA	-0.073***	-0.079***
	(-8.033)	(-8.682)
LEVERAGE	0.032	0.036
	(1.062)	(1.203)
Controls - GICS Sector		
CONSUMER DISCRETIONARY	0.216**	0.178*
	(2.128)	(1.764)
CONSUMER STAPLES	0.105	0.108
	(0.958)	(0.997)
ENERGY	0.042	0.062
	(0.401)	(0.59)
HEALTH CARE	0.548***	0.548***
	(5.256)	(5.282)
INDUSTRIALS	0.085	0.079
	(0.838)	(0.782)
IT	0.193*	0.195*
	(1.87)	(1.892)
MATERIALS	0.093	0.103
	(0.928)	(1.031)
TELECOM	0.148	0.115
	(1.228)	(0.961)
Controls - Year		
2003	-0.004	-0.004
	(-0.114)	(-0.127)
2004	-0.027	-0.028
	(-0.778)	(-0.818)
2005	-0.031	-0.032
	(-0.907)	(-0.932)
2006	-0.029	-0.03
	(-0.845)	(-0.861)
Adjusted R Square	0.131	0.143
Std. Error of the Estimate	0.579	0.575
F	26.180	26.062
Sig.	0.000	0.000

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

APPENDIX C: HYPOTHESES 3-8 COMPLETE RESULTS

Full results for models 16 to 21

Variable	Model 16	Model 17	Model 18	Model 19	Model 20	Model 21
Fundamentals						
(Constant)	0.019	0.062	0.283	0.18	0.005	0.314
	(0.045)	(0.149)	(0.924)	(0.595)	(0.012)	(1.038)
EPS (H3)	0.069***	0.066***	0.032***	0.024**	0.077***	0.043***
	(4.781)	(4.632)	(3.033)	(2.306)	(4.986)	(3.862)
BVPS (H4)	-0.036	0.185	0.388	0.814***	-0.212	0.513**
	(-0.107)	(0.545)	(1.551)	(3.285)	(-0.6)	(2.008)
H5-H6 - Accounting Information Quality						
DAQ		0.185		-0.427*		-0.495*
		(0.528)		(-1.65)		(-1.925)
EPS * DAQ (H5)		0.015		-0.085***		-0.1***
		(0.497)		(-3.717)		(-4.37)
BVPS * DAQ (H6)		1.994***		4.209***		3.702***
		(3.557)		(10.288)		(9.13)
H7-H8 – Unidentifiable Intangible Assets						
FQ			0.653***	0.619***		0.821***
			(5.673)	(5.38)		(6.924)
EPS * FQ (H7)			0.074***	0.073***		0.074***
			(19.398)	(19.369)		(19.759)
BVPS * FQ (H8)			1.006***	1.074***		1.143***
			(15.911)	(17.247)		(18.477)
Family Ownership						
FAMILY					0.065	-0.645***
					(0.226)	(-3.009)
EPS * FAMILY					0.005	-0.031***
					(0.311)	(-2.623)
BVPS * FAMILY					-0.11	-0.509***
					(-0.509)	(-3.291)
Controls - Block holders						
BLOCK					0.075	-0.135
					(0.354)	(-0.898)
EPS * BLOCK					-0.023**	-0.026***
					(-2.091)	(-3.16)
BVPS* BLOCK					0.192	0.407***
					(1.129)	(3.344)
Controls - Firm Characteristics						
GROWTH	-0.083	-0.058	-0.026	0.047	-0.082	-0.047
	(-0.652)	(-0.456)	(-0.245)	(0.451)	(-0.644)	(-0.458)
LEVERAGE	0.334***	0.343***	0.158**	0.157**	0.334***	0.064
	(3.299)	(3.401)	(1.972)	(2.005)	(3.287)	(0.822)
LOSS	0.017*	0.019**	0.001	0.005	0.017*	0.003
	(1.802)	(1.967)	(0.172)	(0.663)	(1.779)	(0.439)
SMALL	-0.187*	-0.182*	0.012	0.005	-0.188*	0.068
	(-1.956)	(-1.899)	(0.152)	(0.069)	(-1.952)	(0.91)
EPS * GROWTH	0.049***	0.051***	0.029***	0.033***	0.051***	0.029***
	(5.66)	(5.902)	(4.468)	(5.236)	(5.775)	(4.561)
EPS * LEVERAGE	-0.118***	-0.117***	-0.072***	-0.059***	-0.116***	-0.053***
	(-15.606)	(-14.241)	(-12.424)	(-9.446)	(-15.309)	(-8.668)
EPS * LOSS	-0.001	-0.001	-0.001*	-0.001	-0.001	-0.001
	(-1.387)	(-1.386)	(-1.896)	(-1.344)	(-1.42)	(-1.41)
EPS * SMALL	-0.001	-0.003	0.019***	0.018***	-0.002	0.017***
	(-0.2)	(-0.429)	(4.027)	(3.898)	(-0.304)	(3.652)

	0.8***	0.74***	0.555***	0.404***	0.815***	0.503***
BVPS * GROWTH	(4.134)	(3.829)	(3.813)	(2.821)	(4.173)	(3.568)
	0.306***	0.358***	0.012	0.158**	0.33***	0.188***
BVPS * LEVERAGE	(3.694)	(4.15)	(0.192)	(2.499)	(3.932)	(3.003)
	-0.095***	-0.11***	-0.01	-0.034*	-0.094***	-0.027
BVPS * LOSS	(-3.674)	(-4.237)	(-0.529)	(-1.784)	(-3.603)	(-1.474)
	-0.797***	-0.759***	-0.809***	-0.744***	-0.787***	-0.691***
BVPS * SMALL	(-7.656)	(-7.309)	(-10.544)	(-9.881)	(-7.509)	(-9.31)
Controls - GICS Sector						
	0.108	0.012	-0.308	-0.289	0.086	-0.299
CONSUMER DISCRETIONARY	(0.265)	(0.028)	(-1.02)	(-0.972)	(0.21)	(-1.023)
	-0.871*	-0.885**	-0.206	-0.089	-0.87*	0.022
CONSUMER STAPLES	(-1.934)	(-1.968)	(-0.619)	(-0.271)	(-1.931)	(0.068)
	-0.389	-0.469	-0.322	-0.254	-0.399	-0.255
ENERGY	(-0.931)	(-1.115)	(-1.043)	(-0.832)	(-0.953)	(-0.855)
	0.377	0.344	-0.388	-0.252	0.355	-0.316
HEALTH CARE	(0.908)	(0.826)	(-1.227)	(-0.809)	(0.855)	(-1.04)
	-0.051	-0.099	-0.372	-0.311	-0.076	-0.319
INDUSTRIALS	(-0.124)	(-0.241)	(-1.234)	(-1.045)	(-0.187)	(-1.095)
	0.007	-0.069	-0.397	-0.314	-0.004	-0.341
IT	(0.018)	(-0.165)	(-1.289)	(-1.031)	(-0.009)	(-1.144)
	-0.35	-0.437	-0.512*	-0.441	-0.364	-0.435
MATERIALS	(-0.871)	(-1.074)	(-1.721)	(-1.493)	(-0.904)	(-1.509)
	-0.03	-0.093	-0.363	-0.329	-0.06	-0.333
TELECOM	(-0.061)	(-0.192)	(-1.012)	(-0.934)	(-0.124)	(-0.965)
	0.022	0.022	0.024**	0.026***	0.02	0.017*
EPS * CONSUMER DISCRETIONARY	(1.616)	(1.609)	(2.405)	(2.635)	(1.428)	(1.729)
	-0.013	-0.013	0.006	0.009	-0.013	0.003
EPS * CONSUMER STAPLES	(-0.945)	(-0.925)	(0.621)	(0.913)	(-0.964)	(0.303)
	-0.033**	-0.03**	0.005	0.017	-0.035**	0.008
EPS * ENERGY	(-2.201)	(-2.007)	(0.415)	(1.512)	(-2.251)	(0.755)
	0.076***	0.076***	-0.01	-0.003	0.073***	-0.015
EPS * HEALTH CARE	(5.386)	(5.413)	(-0.895)	(-0.306)	(5.067)	(-1.377)
	-0.007	-0.009	0.008	0.011	-0.007	0.005
EPS * INDUSTRIALS	(-0.538)	(-0.65)	(0.841)	(1.094)	(-0.542)	(0.504)
	0.023	0.022	0.014	0.019	0.021	0.01
EPS * IT	(1.442)	(1.357)	(1.221)	(1.637)	(1.328)	(0.831)
	-0.013	-0.012	0	0.009	-0.012	0.002
EPS * MATERIALS	(-0.966)	(-0.875)	(0.03)	(0.866)	(-0.909)	(0.217)
	-0.001	-0.001	0.036***	0.037***	0.002	0.031**
EPS * TELECOM	(-0.053)	(-0.05)	(2.801)	(2.936)	(0.096)	(2.534)
	0.372	0.275	0.61**	0.439*	0.494	0.707***
BVPS * CONSUMER DISCRETIONARY	(1.153)	(0.857)	(2.564)	(1.881)	(1.51)	(3.047)
	1.176***	1.051***	0.991***	0.77***	1.262***	0.808***
BVPS * CONSUMER STAPLES	(3.617)	(3.241)	(4.129)	(3.264)	(3.836)	(3.459)
	1.522***	1.319***	1.231***	0.809***	1.624***	0.929***
BVPS * ENERGY	(4.47)	(3.851)	(4.879)	(3.237)	(4.678)	(3.725)
	0.836**	0.585*	0.776***	0.303	0.968***	0.468*
BVPS * HEALTH CARE	(2.533)	(1.759)	(3.139)	(1.235)	(2.876)	(1.908)
	0.584*	0.439	0.893***	0.633***	0.683**	0.808***
BVPS * INDUSTRIALS	(1.792)	(1.346)	(3.711)	(2.676)	(2.072)	(3.451)
	0.378	0.288	0.8**	0.537	0.49	0.709**
BVPS * IT	(0.827)	(0.629)	(2.354)	(1.606)	(1.067)	(2.153)
	1.043***	0.868***	1.282***	0.929***	1.121***	1.036***
BVPS * MATERIALS	(3.21)	(2.658)	(5.348)	(3.919)	(3.417)	(4.426)
	0.853	0.725	1.424***	1.213***	0.979*	1.474***
BVPS * TELECOM	(1.454)	(1.24)	(3.282)	(2.854)	(1.647)	(3.499)
Controls - Year						
	0.013	0.017	-0.074	-0.066	0.011	-0.075
2003	(0.099)	(0.134)	(-0.79)	(-0.717)	(0.084)	(-0.838)

	0.016	0.01	0.017	0.004	0.016	0.001
2004	(0.125)	(0.082)	(0.185)	(0.042)	(0.122)	(0.016)
	0.104	0.092	0.118	0.086	0.105	0.089
2005	(0.808)	(0.72)	(1.24)	(0.927)	(0.818)	(0.974)
	0.319**	0.317**	0.243**	0.23**	0.323**	0.249***
2006	(2.478)	(2.472)	(2.539)	(2.461)	(2.51)	(2.716)
	-0.009	-0.009	0	-0.002	-0.009	-0.003
EPS * 2003	(-1.522)	(-1.56)	(0.015)	(-0.423)	(-1.483)	(-0.605)
	0	0	0.005	0.003	-0.001	0.001
EPS * 2004	(0.018)	(0.059)	(1.09)	(0.714)	(-0.186)	(0.248)
	0.007	0.006	0.011**	0.006	0.006	0.004
EPS * 2005	(1.167)	(0.998)	(2.281)	(1.373)	(1.009)	(0.942)
	0.013**	0.013**	0.009**	0.007*	0.013**	0.009**
EPS * 2006	(2.169)	(2.024)	(1.977)	(1.659)	(2.134)	(1.992)
	-0.094	-0.093	-0.007	0.005	-0.096	0.025
BVPS * 2003	(-1.091)	(-1.082)	(-0.107)	(0.078)	(-1.114)	(0.416)
	-0.03	-0.025	0.045	0.069	-0.014	0.11*
BVPS * 2004	(-0.346)	(-0.29)	(0.705)	(1.1)	(-0.162)	(1.774)
	-0.029	-0.005	0.034	0.099	-0.018	0.139**
BVPS * 2005	(-0.312)	(-0.055)	(0.507)	(1.488)	(-0.192)	(2.117)
	-0.338***	-0.331***	0.007	0.019	-0.345***	0.009
BVPS * 2006	(-3.657)	(-3.601)	(0.104)	(0.279)	(-3.73)	(0.132)
Adjusted R Square	0.825	0.827	0.905	0.909	0.825	0.913
Std. Error of the Est.	1.840	1.830	1.357	1.327	1.839	1.297
F	269.129	257.231	511.023	507.699	240.494	482.710
Sig.	0.000	0.000	0.000	0.000	0.000	0.000

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

APPENDIX D: HYPOTHESIS 2 SENSITIVITY TESTING

This appendix contains the results for hypothesis 2 using alternate definitions of unidentifiable intangible asset. As observed below, the FAMILY effect is stable and is not sensitive to the choice of proxy.

Variable	**FQ**	**Tobin's Q**	**Industry-adjusted Q**	**Hedonic Q**
(Constant)	0.803***	0.808***	0.834***	0.854***
	(5.631)	(5.507)	(5.388)	(5.294)
FAMILY	0.479***	0.483***	0.504***	0.504***
	(6.245)	(6.123)	(6.057)	(5.811)
BLOCK	0.228***	0.236***	0.263***	0.247***
	(3.853)	(3.878)	(4.088)	(3.69)
SIZE	-0.048***	-0.048***	-0.05***	-0.05***
	(-9.25)	(-8.995)	(-8.834)	(-8.574)
AGE	-0.062***	-0.066***	-0.066***	-0.066***
	(-3.517)	(-3.622)	(-3.427)	(-3.288)
GROWTH	0.000	0.000	0.000	0.000
	(-0.007)	(-0.091)	(-0.08)	(-0.039)
BETA	-0.079***	0.022	0.019	0.023
	(-8.682)	(0.714)	(0.597)	(0.684)
LEVERAGE	0.036	-0.078***	-0.079***	-0.08***
	(1.203)	(-8.349)	(-8.07)	(-7.86)
Controls - GICS Sector	YES	YES	YES	YES
Controls – Year	YES	YES	YES	YES
Adjusted R Square	0.143	0.134	0.125	0.118
Std. Error of the Estimate	0.575	0.592	0.625	0.651
F	26.062	24.292	22.463	21.022
Sig.	0.000	0.000	0.000	0.000
n	2850	2850	2850	2850

Notes: ***, **, and * denote significance at the 1%, 5% and 10% levels

FAMILY is a continuous variable that accounts for the percentage of family ownership of the firm's shares. BLOCK is a continuous variable that accounts for the percentage of the firm's shares that is held by block holders (excluding family ownership). SIZE is the natural logarithm of the average total assets for the year. AGE is the natural logarithm of the number of years since incorporation. GROWTH is the sales growth in the past year. BETA is a proxy for market risk and is based on weekly share prices. LEVERAGE is total debt divided by the market value of equity at the end of the financial year. All continuous variables are winsorized at 1% and 99%.